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Non-ferrous Research

After an interval of probably a decade, we recently visited the laboratories of British Non-ferrous Metals Research Association. Consequent upon war-damage and increased activities, much reconstruction and extension has been undertaken. Like Topsy, the buildings have just grown up, but the outcome is no worse for that. We have a distinct liking for self-contained sections in research establishments, as scientists work better under such conditions. A corner of a huge laboratory as a working place does not give that essential "homely" atmosphere. Moreover, unlike industrial establishments, systematic flow of materials is of minor importance. The staff, now numbering 125, is engaged on research for all the non-ferrous industries, and it is interesting to note that the part of it now devoting itself exclusively to foundry problems is probably greater than was used originally for the whole of the Association's activities.

The foundry researches now being undertaken are of a particularly interesting character. Nothing could be more useful than a knowledge of the action of the molten metal on the mould face or *vice versa*. The foundry industry is particularly appreciative of the great amount of work done in the direction of achieving soundness in light-alloy castings through a combination of fundamental knowledge and control. At the time of our visit we noticed a mould arranged so that by means of pyrometer thermocouples extending by increments into the heart of the mould recess, the thermal history of the casting could be evaluated. The work on test-bars for gunmetal castings and the like has also been acclaimed as a more than useful basis for further work by industry. One of the latest activities is that of the vitreous enamelling of light alloys. Using several alloys as base metals (a number of 2½ in. square tiles carrying "sunset" fluting by way of decoration) a variety of coloured samples has been produced. Whilst drawing upon the resources of the ceramist, the Association are accumulating information which should ultimately enlarge the sales for light-alloy products. The electron microscope has been installed and this, together with much other physical apparatus, places the laboratory in a splendid position to undertake work of a fundamental character. Spectrographic analysis, which is finding ever-increasing application in the light-alloy foundry laboratories, is being intensively developed. The library and information department—a section with which we repeatedly make contact—is doing excellent work in providing industry with answers to current questions. This useful service, though not generally in the limelight, saves industry much time and trouble, the cash value of which is great, though impossible to evaluate.

Foundry circles have long discussed the advantages and drawbacks of creating one huge research organisation for the whole industry. Obviously, there would be economic advantages in the fuller utilisation of personnel, plant and machinery, but we are convinced that more is to be gained by having separate approaches made to the various problems. During our visit to the laboratories, we were impressed by the conversion of an ordinary Izod machine into shock-tensile tester, operating on hot specimens. A die had been prepared, and recessed so as to take a small tensile specimen. It was divided into two halves, and the one further removed from the falling tup was free to move and thicker so as to receive the falling blow. When working on copper-base alloys at increasing temperatures, information was given which could be correlated with creep results. Whether such a method of testing would be useful for those engaged in research on ferrous metals is for the appropriate authorities to decide. It is clear that Mr. Bailey, the director, and his staff are thoroughly "foundry conscious" and a constantly increasing volume of research in this field can be anticipated. The work now being done well merits the generous support of the non-ferrous foundry industry.

Contents

	Page
Non-ferrous Research	193
Elimination of Cracks in Re-entrant Angles by the Use of Chilling	194
Moulding Technique Aids Production	195
Steel-founding Productivity	201
"Bronze Founding"	206
Foundry Coke Merchants' Association	207
Books Reviews	209
Correspondence	209
Overcharging Core Prints Stop Wasters	210
Trade Practices	210
Modern French Scientific Instruments	211
News in Brief	212
Industrial Accidents	212
Obituary	213
Light Industries for Tees-side	213
Steel Industry's New Records	213
Welding Research in Industry	213
Raw Material Markets	216

British Industries Fair, 1950

This year's British Industries Fair will be the biggest ever held. For the first time, exhibitors will occupy more than 1,000,000 sq. ft. of stand space. More than 3,000 firms will present the latest products of 90 industries grouped, for the convenience of trade buyers, into 32 sections of closely allied trades.

The B.I.F. was first held in 1915, with 391 exhibitors occupying 80,000 sq. ft. The object of that first Fair was to encourage the manufacture in Britain of goods which had previously been imported. Since then, the Fair has been held annually, with the exception of the war years. The Castle Bromwich section was first held separately in 1920. At the 1949 B.I.F., 3,250 exhibitors occupied 962,456 sq. ft. of actual stand space. Overseas trade buyers attending the Fair numbered 17,061; they came from 130 territories. Home buyers and public (restricted) attendance at all three sections of the Fair gave turnstile readings of 287,392.

This year the Fair will take place from May 8 to 19 simultaneously at Olympia and Earls Court in London and at Castle Bromwich, Birmingham. The organisers are preparing for a greater attendance of American and Canadian trade buyers than ever before. Last year there were 784 from the United States and 424 from Canada; this year a 50 per cent. increase is expected from both countries. It is thought that the number of trade buyers from more than 100 other countries will again be about 15,000, although in the light of world trade conditions the abnormally high attendance of overseas visitors at the post-war Fairs (which has averaged three to four times the pre-war figures) cannot be expected to be maintained indefinitely.

Goods at Competitive Prices

Manufacturers' own efforts to reduce export prices, and in many cases the effect of the devaluation of the £ in making British goods a more economic proposition for transatlantic buyers, together provide an additional inducement to shop in Britain. The benefits are not limited to North America; lowering of prices as a result of more efficient production methods has placed British goods in a more favourable position generally, and is of special importance to those countries which are finding it hard to maintain their purchases from hard-currency areas. They will see at the B.I.F. a full range of goods at highly competitive prices. Overseas trade buyers will benefit from four years' intensive market research. The Fair this year will reflect the country's industry geared almost exclusively to producing the goods which overseas markets most urgently need.

These improvements extend, for the first time since before the war, to many of the heavier machinery exhibits to be seen at the Castle Bromwich section. To mark this welcome advance, the Federation of Manufacturers of Contractors' Plant will stage the largest display ever seen at a British Industries Fair of civil engineering equipment specially designed for the task of opening up and developing the virgin areas of the world.

Although the emphasis in manufacturers' exhibits will be more strongly than ever upon export, increasing production has made possible the release of more goods for the home market than in recent years.

WOLF ELECTRIC TOOLS, LIMITED, announce the opening of a Canadian branch at 2271, Bloor Street West, Toronto, 9.

HAVING RECEIVED official sanction, the Cargo Fleet Iron Company, Limited, Middlesbrough, propose to proceed immediately with the erection of a new blast furnace with a hearth diameter of 20 ft. and a weekly capacity of 4,500 to 5,000 tons.

Forthcoming Events

FEBRUARY 27.

Institution of Production Engineers.

Manchester Section :—"Advance of Industrial Heat Treatment," by J. McHenry, A.M.I.F., A.M.I.T., at the College of Technology, Sackville Street, Manchester, at 7.15 p.m.

FEBRUARY 28.

Luton, Bedford and District Section :—Film, "Mechanical Handling," at the Small Assembly Room, Town Hall, Luton, at 7 p.m.

MARCH 1.

Preston Section :—"Modern Foundry Practice," by C. S. Johnson, at the Harris Institute, Corporation Street, Preston, at 7.15 p.m.

Association of Bronze and Brass Founders.

Informal Meeting, at the Clarendon Restaurant, Hammersmith, London, W.6, at 12.30 p.m.

Manchester Metallurgical Society.

"Continuous Casting of Metals," by J. W. Cuthbertson, D.Sc., F.I.M., at the Engineers' Club, Albert Square, Manchester, at 6.30 p.m.

MARCH 2.

Leeds Metallurgical Society

Film, "Modern Chain-making," at the Chemistry Department, The University, Leeds, 2, at 7 p.m.

MARCH 4.

Institute of British Foundrymen.

Lancashire Branch :—"Cylinder Moulding," by D. Redfern, at the Engineers' Club, Albert Square, Manchester, at 3 p.m.

West Riding of Yorkshire Branch :—"Results of Experimental Work on Sand Practice in the Foundry," by T. D. Kershaw, at the Technical College, Bradford, at 6.30 p.m.

"Men Only" Dinner

The "men only" function of the London branch of the Institute of British Foundrymen is this session to be held again. It will be an informal dinner followed by a cabaret show, and is to be held at Londonderry House, Park Lane, London, W.1, on Friday, March 24, at 7 for 7.30 p.m. Tickets for members and their male guests should be applied for before March 24 from the hon. secretary, Mr. W. G. Mochrie, c/o Tyseley Metal Works, Limited, Balfour House, Finsbury Pavement, London, E.C.2. To give members ample opportunity to participate despite a restriction on total numbers, no "guest" tickets will be issued before March 10. The tickets are 21s. each.

A.F.S. Nominations

Mr. Walton L. Woody has been nominated president of the American Foundrymen's Society. He is the president of the National Malleable and Steel Castings Company of Cleveland, Ohio. Mr. Woody is to be succeeded as vice-president by Mr. Walter L. Seelbach. He, too, comes from Cleveland and is president of the Superior Foundry Incorporated.

A WARRINGTON BRANCH of the Institute of Industrial Supervisors was inaugurated at a meeting held on February 16.

THE MOND NICKEL FELLOWSHIPS COMMITTEE have announced an additional award for 1949. Mr. E. Brunskill (Mufulira Copper Mines, Limited) is to study the metallurgical practice in the mining, smelting and refining of non-ferrous metals in Africa, with special reference to copper and related metals.

Moulding Technique Aids Production

By S. R. Bridger

The object of this Paper is to describe certain improvements which have been made in moulding and core-making techniques to improve the rate of production and the yield of good castings per ton of metal poured in the foundry with which the Author is connected. It is hoped that these practical notes will indicate to others where similar improvements may be made in their own practices. The Paper was presented to the East Anglian Section of the London Branch of the Institute of British Foundrymen, Mr. W. L. Hardy presiding.

Bolting-ring Casting

THE first example is a cast-steel bolting ring previously made as shown in Fig. 1 (six castings per mould). The troubles experienced with this way of moulding were lapped joints, crushed cores, short runs,

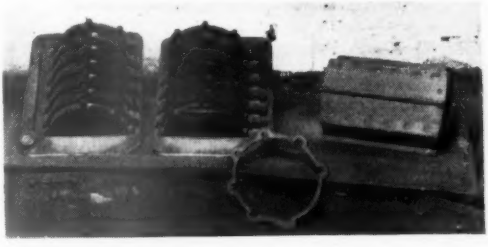

FIG. 1.—ORIGINAL METHOD OF MOULDING CAST-STEEL BOLTING RING.

and there was also difficulty in jointing the cores, which had to be perfectly round. The scrap was high, around 50 per cent., and the matter had become increasingly serious, as the customer was calling for more castings. During a visit to another foundry, a similar type of casting in iron was seen being made by the multiple-core method, and this, coupled with the fact that some heavier-type castings in the Author's foundry were made in a stack by the use of cores, resulted in an attempt being made to produce the bolting ring by the same method.

Two core-boxes, as shown in Fig. 2, were made and sent to the foundry for a sample. The result is shown

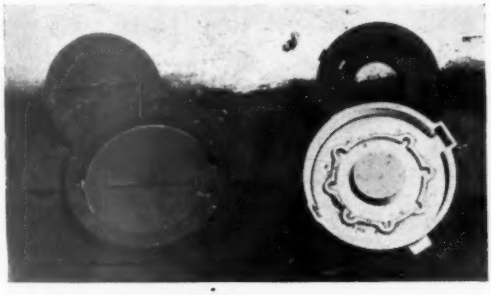

FIG. 2.—TWO CORE-BOXES AND CORES LATER USED FOR PRODUCING THE BOLTING-RING CASTING.

in Fig. 3, which also shows the heavier type of casting already made in a stack. The advantages of this method

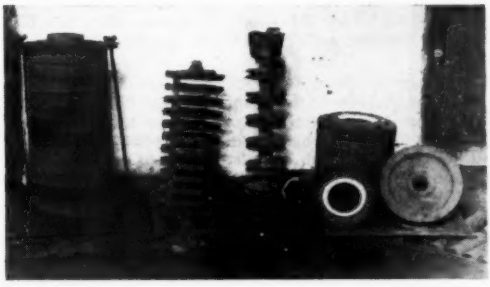

FIG. 3.—(LEFT): BOLTING RING STACK CORE ASSEMBLY AND CASTINGS. (RIGHT): HEAVIER CASTING AND CORES USED FOR ITS PRODUCTION.

were absence of lapped-joint castings, crushed cores or short runs, and a saving of floor space, moulding boxes and fettling. Its disadvantages were the need for more cores, although of a simpler nature, and prevention of sand recovery. A suggestion has been made that these cores should be made in green sand by using a squeeze machine and carrier core-box; this will be explained later.

Bracket Casting

The small cast-steel bracket shown in Fig. 4 (left and centre) presented the problem of how to feed the bottom boss and obtain a sound casting, until the suggestion was made that it should be fed through the core as shown in the central illustration. In the first place, a blind head was placed on the top boss, but this was found

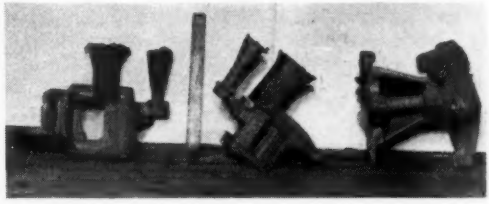

FIG. 4.—(LEFT AND CENTRE): CAST-STEEL BRACKET, LOWER BOSS OF WHICH PRESENTED FEEDING DIFFICULTIES. (RIGHT): SIMILAR BRACKET CASTING MADE WITH A FEEDER-BAR THROUGH THE CORE.

FIG. 5.—PRESENT METHOD OF MAKING BRACKET CASTING SHOWN (RIGHT-HAND SIDE) IN FIG. 4.

to result in a small shrinkage defect. The top feeder was then increased by using an open-head, but, while this overcame the shrinkage, it reduced the ratio of yield of castings to metal poured. Furthermore, feeding through the core necessitated costly fettling operations, three cuts per casting being required as well as chipping and peening of the inside faces of the boss.

A suggestion was made that the casting should be made the other way up with two separate feeders, an open-top one on the side of the top boss and a blind one on the bottom boss. This method (left-hand illustration, Fig. 4) produced sound castings and reduced the fettling operations, and has been used successfully on several castings of a similar type, for example, a second casting as shown at the right-hand side Fig. 4, which was previously made with a feeder bar through the core, is now made, as shown in Fig. 5, with a blind head on each boss and minus the feeder bar.

Core Production from Moulding Machines

The method of making the cores for valve-body castings was by hand ramming and jointing the halves after drying. This was a rather slow process, the time allowed

FIG. 6.—HALF CORE-BOX ARRANGED FOR MOULDING MACHINE PRODUCTION OF THE CORE.

FIG. 7.—FLUID FLYWHEEL CORE-BOX ARRANGED ON A MOULDING MACHINE.

being five minutes per half-core plus eight minutes for jointing, making a total of 18 min. for a complete job.

It was suggested that these half-cores should be made on a jolt-squeeze turn-over moulding machine and, for the purpose of experiment, a core was chosen for an average-size valve—about 16-in. over-all length. In this method, the bottom-half core-box is fixed on the jolt-table and sand is shovelled in level with the top of the box; the core irons are then placed in position. A former is placed on and the squeeze head is brought down and held for two seconds, after which it is returned to the neutral position. The former is then withdrawn, the surplus sand is strickled-off level, the core plate is placed on and the whole is turned over and stripped. The time taken for the complete cycle is 1½ min.

In actual production, all bottom-half cores are made first and dried, after which the top half-cores are made on the squeeze machine, and turned out on the dried bottom halves after these have been gummed. The complete core is then placed in the stove for drying the top half. The time taken for making a top half and

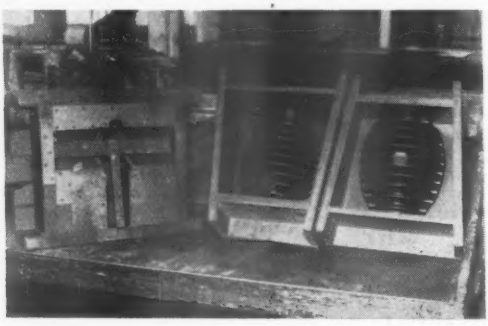

FIG. 8.—A SMALLER VALVE CORE-BOX AND FORMER (LEFT-HAND SIDE) AND PAIR OF FIN-BONNET CORE-BOXES; ALL THESE ARE USED ON MACHINES.

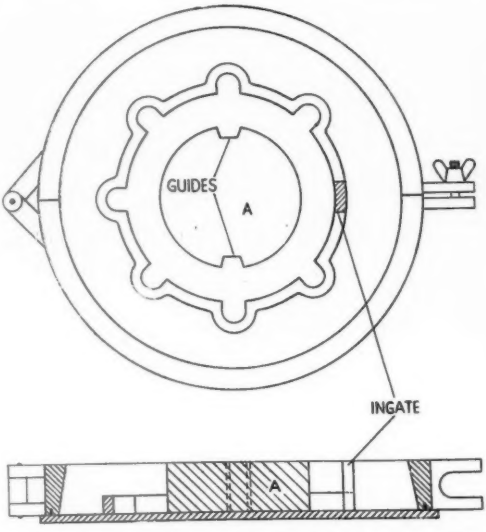

FIG. 9.—METAL CORE-BOX FOR THE BOLTING RING SHOWN IN FIG. 1.

jointing is three minutes, making a total of 4½ min. per core, as compared with 18 min. by the previous method. The top-half box is not fixed to the machine table, and irons are not placed in this half of the core (Fig. 6).

Another type of core made on a jolt-squeeze turn-over machine is that for a fluid flywheel. The box for this is of metal construction with a diameter of 22 in., and is shown in Fig. 7. The box is fixed to the jolting table, sand is shovelled in and strickled-off level, the core irons are placed in position, more sand is heaped on the box, and the squeeze-head is brought down and held for two seconds before being returned to the neutral position. Surplus sand is then strickled-off and the venting jig is placed on. The core is vented and the jig is removed. The loose ring forming the print of the core is drawn out and replaced by two semi-circular pieces of wood of the same dimensions, these taking the place of bedding sand. The core plate is then placed on the core box and the squeeze-head is brought down,

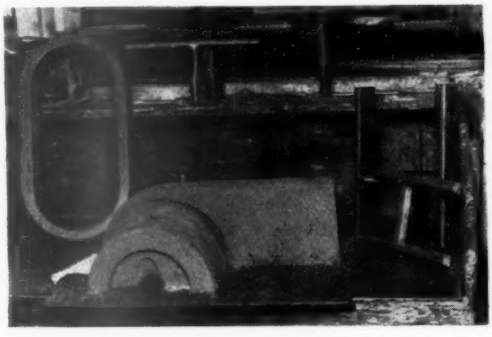

FIG. 10.—HALF CORE FOR A LARGE VALVE.

FIG. 11.—CORE-BOX FOR LARGE VALVE CORE, SHOWING THE SPECIAL 6-IN. CORE PLUG PRINTS.

the machine is rolled over, vibrated, and the box is drawn off. The core and the plate are then removed and the machine is turned back to the jolting position ready for making the next core. The time taken by this method is 12 min., as compared with an allowed time of one hour for hand ramming.

Fig. 8 shows a smaller valve core box and a former used on the machine; also a pair of boxes for fin-bonnets which are squeezed a pair at a time, and Fig. 9 shows a sketch for a metal core box for the bolting ring shown in Fig. 1. This is for use on the squeeze machine to make green-sand cores and, as such cores cannot be handled easily, the box is given a liberal amount of taper so that it may be used also as a carrier for the core. Having squeezed the core and strickled-off level, the box is turned over on the bench nearby and the bottom is drawn off. The section A not only lightens the core, but is a help in drawing the bottom off straight, so eliminating any mending of the core. The box with its core is then placed on a plate already in the casting position on the foundry floor, and the box opened and the core is stripped. The object of the taper in the box can now be fully appreciated; it enables the core to be carried in the box after turning over and removal of the bottom part. The next core is made and placed on top of the first core, and so on until the stack is sufficiently high, the locating guides being placed exactly one above the other to obtain a straight down-gate.

FIG. 12.—LARGE VALVE CORE, WITH 6-IN. CAKE CORE FOR CLOSING THE VENT HOLE.

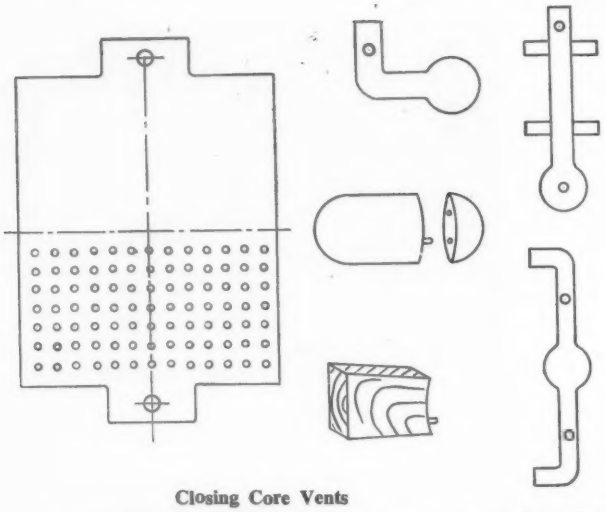

FIG. 13.—MASTER CAST-IRON PATTERN PLATE FOR RECEIVING PATTERNS FOR SHORT RUNS OF CASTINGS. SAMPLES OF RISER AND INGATE PATTERNS ARE ALSO SHOWN.

Closing Core Vents

As previously mentioned, valve cores are made in halves and jointed (Fig. 10) and those over 8-in. part diameter are vented extensively and tied with wire at the ends. Consequently, a moulder's first job after placing the core in the mould is to fill in the vent each end with paper and green sand. It was suggested that to overcome this long and tedious job, all ends of valve core boxes over 8-in. dia. should be printed with a 6-in. dia. print, 1 in. thick, as shown in Fig. 10, and an extra core box should be used for making cake cores for the end prints. This having been done, the operation of closing the vents is thereby transferred to the core jointer, who simply inserts cake cores made from the extra core box into the ends of every large valve core and gums them in position (Fig. 12). The moulder then only places the core in the mould and closes it. The time saved in making each mould is half an hour, and the extra time spent in the core shop for removing loose prints from the box and gumming in the end-cores is 15 min. for each complete core.

Machine Moulding for Short Runs

As the Author's is a semi-mechanised jobbing foundry, all patterns are mounted on plates for machine moulding if there are ten or more castings required. On orders requiring fewer than 10 castings of a design suitable for mounting on plates, a master cast-iron pattern plate, ¼ in. thick and machined on both surfaces, is used for machine moulding. In this plate (Fig. 13) there are 195 holes, at one-inch centres, drilled right through and tapped with ¼-in. Whitworth threads. All split patterns requiring fewer than 10 castings off are drilled and fitted with female dowels. The moulder mounts his own patterns on the plate, screwing them down, or using screwed dowels. He is supplied with a large selection of riser and ingate patterns, some of which are shown in

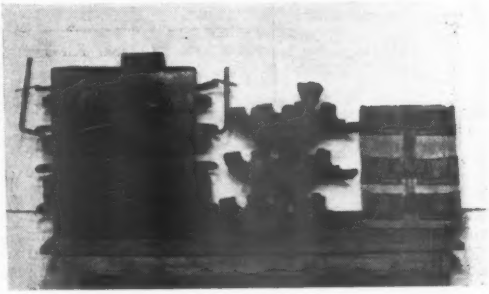

FIG. 15.—SIMILAR ARRANGEMENT FOR STACK MOULDING TO FIG. 14, BUT IN THIS CASE CORES ARE USED TO FORM THE BOTTOM HALF.

FIG. 14.—TYPICAL FLAT-BACK JOB ARRANGED FOR STACK MOULDING.

FIG. 16.—SET OF PATTERNS ARRANGED FOR USING WASHBURN CORES.

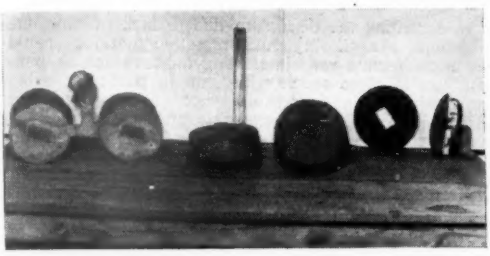

FIG. 17.—CASTINGS WITH FEEDER-HEADS REMOVED AND CORE SHOWING CURVATURE.

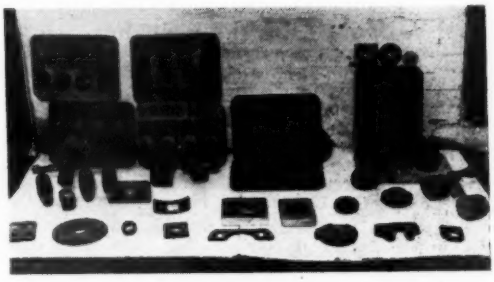

FIG. 18.—CASTINGS AND PATTERN PLATES SET UP FOR USING WASHBURN CORES AND KNOCK-OFF FEEDING HEADS.

the illustration (Fig. 13). This method of producing odd castings has increased the production of this class of work by 200 per cent.

Stack Moulding

On small moulding machines, using boxes 16 by 13 in., two machine operators and two closers make 180 moulds per eight-hour day. A majority of these moulds contain two or more castings, and about 10 per cent. of them are "flat-backs," that is, either cope or drag is flat or with, perhaps, only an impression of a core-print or runner. These types of moulds are ideal for stack moulding, using the same principle as for multiple moulding. For example, the casting shown in Fig. 14 is a typical flat-back job containing eight castings per mould, with cores. Previously these castings were made in cope and drag moulds with core prints in the drag half. The drag-half pattern plate has been dispensed with and the core box reduced accordingly; a tapered down-stick has been fixed to the centre of the runner and a machined plate to the squeeze-head on the machine. The plate is about one inch longer and wider than the moulding box. This particular casting is usually made in batches of 75 moulds, in which case 25 bottom parts are made and then 75 tops which are stacked three high, as shown in Fig. 14. The boxes are rammed with facing sand on the pattern, followed by backing sand and then facing sand above to form the plain face; the correct amount of sand to obtain a perfectly-squeezed mould only being found by experience. A similar example is shown in Fig. 15. These castings were previously made six castings per box by using split patterns, but they are now stacked three high by using small cores to form the bottom half of the casting. The advantages of this method are that less floor space, fewer moulding boxes and less sand are required and only the top two boxes of every stack need clamping together.

Knock-off Feeder Heads

One of the most noticeable features of a steel-foundry fettling shop is the labour expended in the cutting-off of the large feeder heads which are required as compared with those used for iron castings. In an endeavour to reduce cutting-off time, successful use is made of the Washburn core or knock-off riser. This was tried initially with the experimental set of patterns shown in Fig. 16. The first two castings were made by gating into the casting on the joint, but the cores, with a one-inch diameter neck and ¼ in. thick, broke during pouring and caused excessive blowing. The next two castings were made using the same gating arrangement and core sizes and using strengthening irons in the cores. In this case, cores withstood the lifting pressure of the metal.

(*Continued on page* 200, *second column*)

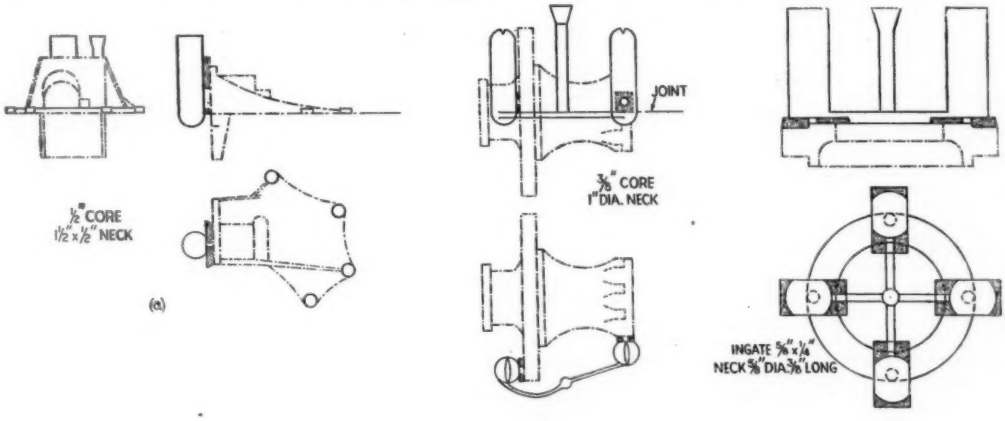

FIG. 19.—MOULD LAYOUTS FOR VARIOUS STEEL CASTINGS.

Notes from the Branches

London Branch—Slough Section

At a meeting of the Slough section of the London branch of the Institute of British Foundrymen, held in the lecture theatre of High Duty Alloys, Limited, on February 14, Mr. W. A. Baker, B.Sc., A.I.M., of the British Non-Ferrous Metals Research Association, gave a Paper on "Gas Unsoundness in Light Alloys."

In introducing it, he dealt with the more familiar aspects of gas solubility and the characteristics of porosity in aluminium alloys. The vacuum-solidification apparatus was recommended as a useful means of indicating gas contents in the foundry—particularly if a lesser degree of vacuum than the figure of 0.1 mm. Hg. originally recommended, was used—this had been proved to be too sensitive. The necessity for the use of a bare steel crucible, free from moisture or dressing, was stressed, to avoid the possibility of a misleading result.

With regard to the use of the tablet form of degasser almost universally employed the lecturer criticised the use of a perforated plunger. This allowed molten metal completely to surround the tablet and gave a very rapid decomposition and generation of chlorine. As the rate of hydrogen removal was proportional to the square root of its partial pressure, its removal became progressively more difficult as the amount decreased, and the efficient removal ultimately depended upon the time of contact with the scavenging vapour. An improved method was the use of an inverted crucible without holes. This did not allow the tablet to be completely surrounded by molten metal, and gave a slower rate of decomposition, with chlorine evolution consequently taking place over a longer period. The bubbling of an inert, scavenging gas such as nitrogen or chlorine through a refractory tube, taken to the bottom of the crucible was still considered to be the most effective form of degasification. From the practical point of view, however, it had the disadvantage of being inconvenient and cumbersome, and the refractory tubes were fragile and easily broken. The use of a covering flux was a means of preventing gas absorption at the melt surface. The desirability of the presence of a certain residual gas content was mentioned—particularly for bronze castings required to be pressure-tight. The pressure of a small amount of gas was useful in dispelling concentration of shrinkage porosity at a change of section.

DISCUSSION

In the discussion, Dr. Schueur was of the opinion that a shaped holder for the crucible in the vacuum-solidification apparatus was an advantage in that it provided progressive solidification and avoided the possibility of a freezing surface skin holding back gas evolution. He also mentioned the rather disconcerting fact that when starting with gas-free metal, its passage through a sand mould could be sufficient to cause the riser to be saturated with gas. To several points raised by Mr. Logan, the lecturer stated that he had never considered the effect on gas content of varying rates of diffusion through the various types of crucibles used, and that covering fluxes were effective and desirable. To the query as to the use of metallic sodium as a means of gas control in a difficult casting, it was stated by Mr. Baker that its effect was not to remove the gas. One effect might be the introduction of further gas due to the inclusion of sodium hydroxide with the sodium, another acted so as to produce a greater dispersion of the existing gas.

In curtailing the discussion due to lack of time, the chairman, Mr. E. Raybould, regretted that they could not pursue some very interesting topics which he himself was in close touch with, one in particular being the intentional and controlled use of gas to prevent shrinkage, porosity, concentration and hot-tearing. A vote of thanks was proposed by Mr. F. C. Evans, who added that in his experience, mainly with copper-base alloys, no such complications arose as appeared evident with aluminium, and he looked forward to the development of something for aluminium alloys which would be as simple as the method in use for copper, where the presence of a small amount of cuprous oxide effectively eliminated gas unsoundness.

Moulding Technique Aids Production

(*Continued from page* 199.)

After removing the castings from the moulds, the feeders were knocked-off and showed a sound fracture, but the castings were sectioned and were found unsound. Other castings were made using the same gating system, increasing the neck diameter by ¼ in. each time until a diameter of 2½ in. was reached, but every casting was sectioned and found unsound.

Two further castings were made, using a one-inch diameter neck and ¼-in. thick core with irons, but gating into the feeder over the core as shown in Fig. 16. One of these cores broke and the other buckled badly, so that on the next two castings the area of the ingate was reduced to slightly less than the area of the neck so that the casting would be run first and the metal would not build up on the core, thus causing it to collapse. The feeders on these two castings were knocked off easily, and the castings were sectioned and found to be sound. The tops of the castings were, however, concave owing to the weight of head metal, and not wishing to increase the thickness of the core, a convex surface was put on the core box. The result was a flat surface on the next two castings, which were also sound. Fig. 17 shows the castings with feeders off and a sectioned core showing the amount of curvature.

The pattern was then put into production with this type of feeder and ingates, and 34 castings were made. All but one broke off and were sound. This one had a small shrink showing in the neck about ¼ in. deep, but, on being sectioned, the casting was found to be sound. This job is now in regular production, with about 0.5 per cent. scrap owing to broken cores. The previous set-up for this pattern was similar to that shown in the illustration, except for the cores, and the ingates were on the joint. After cutting off the heads, a shrink hole which had to be welded was revealed under every head. The new method dispensed with cutting-off, welding, and 75 per cent. of the snagging operation on this particular casting.

A few other types of castings now set-up with knock-off feeders are shown in Fig. 18 with a selection of knock-off feeder cores. Fig. 19 shows typical layouts for other castings.

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Institute of British Foundrymen *London and Sheffield Branches*

Steel-founding Productivity

Discussion of Mr. F. A. Martin's Address.

Mr. F. A. Martin, O.B.E., leader of the team of steel founders which visited the United States, addressed both the London and Sheffield branches of the Institute of British Foundrymen on the subject of Steel Founding Productivity. That delivered to the London branch was followed in accordance with normal practice by a discussion, which is reported below. The Sheffield meeting, however, took the form of a round-table discussion after only a very brief introductory address. On this latter occasion Mr. Martin was supported by five other members of the team. In the account of this second meeting, which is printed contiguously, points arising from the replies are listed and enlarged upon.*

LONDON BRANCH

THE BRANCH-PRESIDENT, Mr. F. Arnold Wilson, opening the meeting, welcomed the very large number of visitors and said he was not at all surprised by the large attendance because the meeting would be extremely interesting. He offered a particularly hearty welcome to Mr. Preston, of Australia.

The Branch was highly honoured by the fact that Mr. Martin would describe the tour by his team in the United States. The London branch had two members in the team—Mr. W. L. Hardy (president of the East Anglian Section) and Mr. Daybell, of Letchworth. All who knew Mr. Martin were very glad indeed and very proud that, as leader of the team, he had been honoured by His Majesty by the award of the O.B.E. He had been the first to say that it was the team that had earned it for him, but those who knew him felt that it was due to his dynamic influence as leader of the team. He had driven himself and his team hard, and it was to be expected that the results would be highly profitable.

Discussion

A MEMBER asked what sort of dyestuffs one could put into foundry sands in order to distinguish one from another and be able to avoid misuse.

MR. MARTIN said he did not know what dyestuffs were used, but he had no doubt that they were proprietary. They were known in this country and he had no doubt that one could obtain information by making enquiries of the suppliers. The American foundries were quite bright, for there were greens and yellows and browns, and so on, put into white silica sand.

Definition of Productivity

MR. J. F. KAYSER (past Branch-president) said that, although he had carefully listened to Mr. Martin's definition of "productivity" it was clean above his head and he did not know what it meant. Why did Mr. Martin use the word "productivity"? He (Mr. Kayser) knew quite a lot about American firms and whilst he did not say there was none which used the word "productivity," he thought the more usual phrase was "rate of production." Rate of production could be expressed as output per man-hour, per machine-hour or also per square yard of factory area. Those were factors which could be definitely determined and used to compare the efficiency of one foundry with that of another. It was, of course, useless to compare the efficiency of a foundry making light castings with one making heavy castings.

Mr. Kayser suggested that Mr. Martin had really only dealt with the findings of the team during the last two minutes of his talk, and he had assumed that everyone had read the Report. He (Mr. Kayser) thought that in America the relationships between the different sections of workers was much closer than it was in this country. If anything went seriously wrong in respect of production in an American plant it was usual immediately to hand the matter over to the experts who were so used to such a procedure that no difficulty ever arose in co-operation between the man who was actually doing the job and the research worker away in his laboratory. That did not seem to be done in this country to anything like the same extent as it was in America. There was one point he would like to stress and that was that, in his experience if the management and general organisations were similar, factories in the United States, England, France, South America or practically anywhere in the world could achieve comparable rates of production per man-hour or in accordance with any other basis that might be adopted for comparing rate of production. He did not think there was anything wrong with the workers in any country, but he had grave doubts about some managements.

MR. MARTIN said he was very much indebted to Mr. Kayser for raising the question concerning the definition of "productivity." They had been trying to find terms which were completely general in application. But the choice of the word "productivity" was not the choice of the team; they were not sent out as a "rate of production" team, but as a "productivity" team; and as "rate of production" occupied a little more space on paper, he had used the word "productivity." The term "rate of production" could be a little confusing. The word "rate" was connected in our minds with the idea of speed and that was not quite what he wanted to get across. Indeed, the word "rate" in the English language had so many meanings that it was necessary to get away from it. He was not certain whether or not Mr. Kayser intended to imply that in the Paper the workmen were being criticised.

MR. KAYSER said that he did not.

MR. MARTIN agreed that, fundamentally, the problem was one of management, and speaking as a manager, he accepted full responsibility.

B

*Address printed in the JOURNAL February 16.

Steel-founding Productivity—Discussion

Market Potential and Auxiliary Equipment

MR. B. LEVY asked if the production quantities did not play a very important part in the productivity of any kind of industry. When in the United States in the previous year, he had noticed that the quantities of any given article produced by American concerns, whether they were engineering, foundry, pattern shop or any other kind of undertaking, were always greater than in the comparative English firms. In other words, their market potential was very much greater than that of Great Britain. In America the home market was greater, of course, and as the home market potentiality was the basic factor on which production began, it would seem that the American manufacturer started with a great advantage over the British.

With regard to mechanisation, when visiting several large pattern shops in the U.S.A. he had noted the absence of specialised machinery, particularly such as universal wooden-pattern millers. The average mechanic there went about his job in much the same style as we in this country had done 20 years or more ago, and it appeared that, at least in the pattern shop, we were as up-to-date as, if not surpassing, the United States.

Finally, inasmuch as competition was open in the American market, the element of price-cutting was brought in; and, of course, there was competition among the men themselves to work "all-out" the whole time. Again, the management were all-out to buy in the cheapest market, and they had the advantage that practically all the raw materials were available on their doorsteps, whereas we had to import at least part of ours. Those facts would seem to have a great bearing on productivity in general and the cost per man-hour. Furthermore, we in this country had to buy many of our materials at controlled high prices; we were controlled by the Government in all sorts of directions, which stultified the efforts of the enterprising manufacturer.

MR. MARTIN replied that he was in emphatic agreement that the order book was one of the essential elements in achieving productivity, and the Americans admitted that. Mr. C. W. Briggs, when discussing the problem with the team, had emphasised that high productivity could not be achieved without a good order book.

He was not sure that he agreed entirely with Mr. Levy concerning the market question. It was true that the American market was huge, but it cost a tremendous amount to send a casting made at one end of America to a customer at the other end. The steel foundries, except those engaged on speciality work, tended to supply the engineering organisations in their immediate vicinity, so that they had not themselves a tremendous market. On the other hand, it must be remembered that the engineering industries were not so much affected by the transport problem in respect of their finished articles, so that they could and did standardise their articles to a much greater extent than ourselves. In that connection Mr. Martin recalled that in the report of 1853, which he had mentioned in the address, reference was made to standardisation. Only two weeks ago, two documents were issued in this country dealing with standardisation and simplification; we were still trying to follow advice which probably was given first in the days of Tubal Cain.

There had been a patternmaker in the team, and he was a most disappointed man, because the pattern shops in the American steel foundries were only there for mounting and repairing patterns; only a few of the steel foundries made their own patterns, the others preferring to send the work out. However, the patternmaker did go into one of the shops and had found it quite well equipped; it belonged to a very up-to-date company, and Mr. Martin was quite unable to say what the general run of pattern-making shops were like.

MR. D. GRAHAM BISSET asked whether the team had had any choice of foundries they visited. Were there any secrets?

MR. MARTIN said the team had no choice in the first place, but after they had arrived in America an effort was made to enable them to see some of the places they had asked to see. However, the team was the first to go to America, and even at the time the team had left this country, the organisation to receive them in America did not exist; it was being set up while they were on board the Queen Mary and, although it existed when they had arrived, the wheels were perhaps not turning easily. They had seen some good foundries, and others not so good; they did not see how bad American foundries could be, but some of the good ones they had seen were very good.

Emphasis on "Live" Management

MR. C. H. KAIN (past branch-president) said it was very pleasing to read the editorial of the November issue of "The Foundry," where, in a comment on the Report, it was stated: "Nevertheless, foundrymen of this country" (U.S.A.), "and not alone steel foundrymen, can profit from the Report." That comment, in that publication in America, was probably the greatest compliment that could be paid.

In thinking over the Report, Mr. Kain had been very much impressed by three particular factors. The first was the reference to the energy which had been shown by the managements of all the steel foundries which the team had visited in America; as Mr. Martin had pointed out, that was a real factor in their success. The second factor was the ingenuity displayed in applying details, various gadgets for turning over, a willingness to apply new techniques and to use proper sands. It was within our power in this country to do likewise. Thirdly, one was impressed by the massiveness and the reliability of the equipment available in America. We had no foundry machinery available in this country sufficiently massive to handle large quantities of work quickly. For example, we could not get an airless shot-blast machine in this country to handle five-ton batches of steel castings; smaller ones only were available here. Possibly, larger ones would become available if there were a sufficient demand. That reference led Mr. Kain to mention the very pertinent question of price. Although some reference had been made by Mr. Martin to personal taxation, there was no reference to capital taxation. He would appreciate some indication of how American industries raised the large sums of money that were necessary to buy the very fine equipment mentioned in the Paper.

MR. MARTIN, in commenting on equipment, said that in America, Mr. Briggs had talked about the installation of sand-handling plants in the steel foundries, and had said that most of those foundries had good equipment for that purpose, and that those who had not already installed it were simply waiting until they had made sufficient money to enable them to buy it.

Relative Value of Productivity

A MEMBER said he assumed that the costs and percentages given with regard to increased production included every type of labour employed in the foundry on production, from the moulder right up to the management itself.

MR. MARTIN said the figures covered only the foundry floor.

The PREVIOUS SPEAKER, whilst appreciating that in the first place the team went to America to study production, asked how the final costs worked out, because in this country at any rate we were right up against costs of production, apart from quantities produced. It was of no use making very large quantities at very high prices, because we simply would not be able to sell them. He wondered whether Mr. Martin had any sort of comparison of costs which would give an idea of how American dollars compared with our English pounds. He added that, apart from actual cost, there was the factor of capital investment and how it was all allocated.

MR. MARTIN said he might have given a correct reply on September 18, 1949, but it would have been wrong by 9 a.m. on the 19th. It was of no use comparing cash costs as between America and this country. The dollar bought so much gold, the pound bought so much gold, though not so much as it did a short time ago; that was about all one could say concerning their relative values. There were a lot of things trailing on behind the price of gold, but there was a measurement which was constant, and that was man-power. Eventually we could only measure man-power against what man-power produced, and he believed that in the long run it was the only measurement that was worth anything.

When the team were in America, when the pound would still buy 4.03 dollars, the price of American steel castings was slightly higher than that of British steel castings, taking the whole range. Then on September 19, the American price was at least 30 per cent. above the British. But that had not made either American or British steel founding any more or any less efficient; on the basis of man-hours they still bore the same ratio as previously, so that he felt it was rather a waste of time to talk too much about relative costs as measured in pounds and dollars.

Reluctance to try New Equipment

MR. W. TAIT, after congratulating Mr. Martin on an excellent address, said that he was obliged to agree that we were not very receptive of new technical ideas in this country. In this connection, the Americans had recently published a booklet under the title "The Technological Stagnation of Great Britain." In this booklet it was pointed out that if one introduced a new idea in England it was extremely difficult, as history knows, to establish it, the new idea had to be sold overseas before it was accepted at home. In his own company, certain newly-developed equipment was being sold very successfully overseas, in fact, it was interesting to note that 97 per cent. of the orders on the books for this new equipment was from overseas.

He agreed with Mr. Martin that the Americans were very great experimentalists, and would try new ideas, but unfortunately in this country it was a very difficult task to get anybody to accept a new idea unless they could see a machine working in somebody else's factory, and then they often asked for it for trial purposes. All this did not encourage the foundry-equipment people in this country to spend large sums of money on developing new ideas, or the building of prototype machines. It must be realised that development is extremely costly, and it was up to the foundries to support the foundry-equipment business in a much more logical manner than had been done up to date.

Vote of Thanks

MR. D. GRAHAM BISSET, proposing a vote of thanks to Mr. Martin for his address, said that Mr. Martin was the leader of the first productivity team to visit America, and as in a small way, he, himself, had been concerned with the preparations for the team of general ironfounders which was going to America to study the ironfounding industry, he assured Mr. Martin that his report and experience in America had been of very great help in making arrangements for the ironfounding team. Mr. Martin had done a great job of work; he had had a lot to do before the departure of the team, had put in much concentrated effort when in America, and on returning to this country had spent a considerable time in making information available. The meeting was very deeply indebted to him for his provocative and interesting address.

MR. V. C. FAULKNER (past president of the Institute and of the London branch), seconding, said that Mr. Martin had already assured for himself a great name which would be handed down through generations of foundrymen, as belonging to a man who had not only proved himself a great leader, but had shown himself to be no mean exponent of the art of publicity. His Paper was a wonderful blend of philosophy, psychology and technology, and few people could blend these so well as he had done. It was a privilege to take part in expressing thanks to him, and to assure him that the meeting had enjoyed every moment during which he had been speaking.

(The vote of thanks was carried with acclamation).

MR. MARTIN, in his response, said he felt it very difficult to recognise himself from the eulogistic remarks which had been made. He was just an ordinary steel founder, and he liked to tell the truth when he saw it, or when he thought he saw it; and he had found that not only steel founders, but all other founders, listened to the truth when it was spoken with sincerity. He prayed that he would always speak it sincerely. He was grateful for the reception accorded him, which had turned the labour of preparing the address into a great joy.

SHEFFIELD BRANCH

The meeting of the Sheffield branch of the Institute of British Foundrymen, devoted to the same subject of steelfounding productivity, was run on novel lines. Instead of the usual presentation of the Paper followed by questions, the subject was introduced and at any time a member of the audience could interject a question or questions. Three questions at a time was the limit. The attendance was the largest for a long time. The subject—Productivity—may have had something to do with this, but the fact that many members asked for further discussion at the next meeting was evidence that the change of procedure as well as interest in the subject was appreciated.

The discussion was opened by MR. F. A. MARTIN; *he had with him five other members of the productivity team—Mr. Taylor, Mr. Hammond, Mr. Travis, Mr. Colbridge, and Mr. Jackson.*

MR. J. G. BAILES, the branch-president, welcomed the large gathering and also the members of the productivity team. He mentioned that a telegram of congratulation and good wishes had been sent to the ironfounders' productivity team which was sailing that day for the United States, and added that in that team there was a Sheffield member, also a Mr. Martin.

Steel-founding Productivity—Discussion

MR. F. A. MARTIN said he wanted to get out of the run of the ordinary meeting and, if the team speakers were not interrupted, they would be woefully disappointed. He showed on the screen a map of the route covered by the team in the United States and the places visited—New York, Buffalo, Detroit, Chicago, Milwaukee, Springfield, Pittsburgh, Philadelphia, Columbus, and Washington.

Points from the Replies

From the barrage of questions and answers that followed one gathered the following impressions and opinions:—

Productivity meant not working each man harder, but using each man better; Americans claimed to do mighty things, but it did not come out quite that way in the wash. Almost without exception, the general run of foundries in America was no better than in this country, and were much of the same average size; figures were obtained of foundries making only 30 tons of steel castings per week. Throughout the trip there had been not the slightest unpleasantness. Members of the team sought their "opposite numbers" at the works visited and discussed things with them. Everywhere they were extremely well received. As many as twelve men were employed making one core. In the highly-mechanised foundries the team saw sand dropped from a gravity box and as it fell it partially rammed itself. Many jobs were very monotonous. Estimating was not much done because a lot of the work was merely repetition. Foundries gave an estimate for 10 or 100 castings and after that gave a fixed price for a job.

Storage of patterns was perfect, all patterns being complete before they were stored. Over there, a pattern was no better constructed than in this country. Very little was seen of time and motion studies, but in one or two instances time studying as a price check was seen.

Incentives and Payment

Rates of pay varied greatly between establishments. In most establishments the hourly basis was about $1.56, but there were places where $2 per hour could be earned. Various forms of incentives should be considered in talking of pay rates. The $1.56 pay obtained mostly in fettling shops. In one factory the incentive was time off. When a task was done, everybody went home and the average work in that factory was 6 or 7 hrs. a day. The aim of the workers was to earn as much as possible in as short a time as possible. That done, men and employers were happy.

Equipment

Equipment was always at hand for the worker. In this country, men were often to be seen walking about looking for boxes and clamps. The Americans scored in good layout and good servicing. The standard of management in America was higher than in this country. One man said he had substantially reduced the cost of Sandslinger moulding by the introduction of a special machine which rammed in sand at the rate of a ton a minute. A sand reclamation machine seen was called a "Knock-out." Eighty tons of sand was reclaimed from 100 tons at a cost of $1½ per ton. Overhead cranes travelled at a great speed, and the loads from magnets collecting steel were dropped as they travelled. All castings looked bright and well fettled and shot-blasting was a very important process. Round shot was more in favour than angular shot, and the round "malleable" shot was reputed to last much longer. A 4-ton furnace was charged in 8 to 10 minutes and there were other ways of saving time.

MR. MARTIN said the team found in the United States that every foundry was interested in getting more goods manufactured and economising in man-power. They thought man-power was very important and they got the best from a man's skill by giving him such tools as he was capable of using. Men were spurred on by various incentives. We in this country needed to show more courage in trying new methods to get over the difficulties ahead of us. They were not impossibilities, but they would take time to overcome. In his concluding remarks, Mr. Martin said it had been a very useful discussion. It had been very pleasing to joint up again as a team, and for the team he thanked the branch for giving them this opportunity of explaining their observations.

Thanks were passed to Mr. Martin and his team on the motion of the president, seconded by Mr. W. Donaldson, who said since they had returned from America and their Report had been published, there was a different atmosphere in the steel foundry.

Acknowledging the thanks, MR. TAYLOR said, if it could be arranged to continue the meeting, there was much more they could say.

Curing One Trouble Causes Another

By "Coroner"

Often when castings are found to give trouble caused by the adoption of a particular method of manufacture, alternative ways can be found by which trouble-free castings can be obtained. Occasionally, however, unless special care is exercised, the curing of one trouble may lead to another, possibly of more serious consequences.

A typical case concerned some cast-steel brake shoes. These were required from the foundry in such a condition that only the minimum of machining need be carried out in the engineering shop. Complaints were received that, owing to the taper on that face of the casting on which the brake lining had to be secured, a costly machining operation was necessary to remove the excess metal.

Examining the pattern, the foundry executive decided that taper could be eliminated from this face, but only by forming it by a core. The extra expense of the core was considered to be justified by the saving in the machine shop. Consequently, a batch was produced by this method. A new trouble was then discovered in the foundry inspection department—small cracks were found in the castings, and at first it was difficult to account for them. Ultimately, they were traced to the thin "flash" which occurred over the core forming the face of the casting. This "flash" when cooling cracked, and when removed the crack was often found to extend to the casting as well. Overcoming the taper trouble gave rise to that of cracking until more careful core assembly eliminated this "flash" and the attendant cracks.

Pistons.—Specialoid, Limited, of Friern Park, London, N.12, have used a gloriously-coloured, extra-large, 12-page brochure to describe and illustrate by clear blueprints the pistons they make for nationally-known cars. When we recently enlarged the size of the JOURNAL, we apologised to those who had had specially-made files to house them and which now may be useless. On receiving this very nice brochure, the reviewer felt that firms would find such a large format very inconvenient for filing.

"Bronze Founding"

Propaganda Film in Colour

At a meeting of the Lancashire branch of the Institute of British Foundrymen held in the Engineers' Club, Manchester, on January 11, over which Mr. R. L. Handley, B.Sc.(Tech.), presided, the colour film "Bronze Founding" was presented by Mr. F. Hudson.

THE CHAIRMAN, in opening the proceedings, said Mr. Hudson was well known to most of the members of the Institute. The film to be shown by Mr. Hudson was of interest from the point of view of its technical qualities in illustrating the non-ferrous side of the founding craft, and also as a propaganda medium from an educational and training standpoint.

MR. HUDSON said it would be generally agreed that a film was extremely useful for showing how a job was carried out. In this direction, he instanced the excellent film made in Manchester by Mr. Van der Ben and the National Gas & Oil Engine Company, Limited. Such films provided an excellent medium for advertising and popularising foundry activities. They played also a useful part in research work such as the investigation of running methods by the use of the high-speed camera. The metal could be made to appear still and therefore could be examined in a very short interval of time. Up to the present the foundry industry had not made extensive use of the many advantages offered by the ciné film. This was no doubt due to the considerable cost entailed in film production, particularly those made by professional units. If costs were to be reduced, it was essential that production should be undertaken by someone with good knowledge of the industry. In other words, the necessary films must be produced by founders themselves. The film about to be displayed was the first production from a unit formed within the industry, having such thoughts in mind.

The attraction of juvenile labour to foundry work had long been a problem with those who were concerned for the future welfare of the industry and of craftsmanship. Many reasons had been advanced for the reluctance shown by school-leavers to enter the industry, one being the question of working conditions as compared with other branches of industry. There was no doubt that, in the past, unfavourable comparisons could be drawn between the lot of the moulder and, say, an operator in the machine-shop.

The wider adoption of mechanisation and particularly of lifting appliances had, during recent years, excluded much hard manual labour which at one time precluded the employment of all but the toughest.

The provision of washing facilities, canteens, and other amenities had done much to ameliorate working conditions in the large majority of foundries. The inauguration of training classes for foundry apprentices, both with individual works and on a wider regional basis, was a sign that employers had the welfare of their workers at heart. Yet despite all these improvements recruitment was still slow. Could it be that the problem was being tackled from the wrong angle? From what he remembered of his own boyhood he could not recall that dirt, discomfort or hard work prevented him from attempting a job in which he was interested. He had no reason to believe that the modern boy was any different. In other words, if an interest could be created in the modern boy, then working conditions, within reasonable limits, became of secondary importance.

A suitable ciné film with a wide circulation in technical schools and in industry would assist in creating that interest. The film to be shown had been made, primarily, with that object in mind. As well as attracting the best type of youth into the foundry it was hoped that the film would also be of interest to those already engaged within the industry.

Details of the Film

The film which was then shown to the meeting is in colour, and opens with a foreword by Mr. F. G. Burrell, past-president of the Association of Bronze and Brass Founders. The commentary is spoken by Mr. Frank Phillips of the B.B.C. The foundry scenes in the film were taken in five foundries in various parts of Great Britain, extending from Hull to London, and it was taken without any interference to production.

In the early part of the film the development of bronze and brass castings is traced from very early times. Bronze founding was the oldest branch of the founding industry, the first casting being made approximately 5,000 years ago. Stress is laid upon the important part played by bronze castings in daily life. Phases of foundry production from the pattern to the finished casting are realistically portrayed. Castings shown in their natural tones are, undoubtedly, more impressive than when shown in ordinary black-and-white rendering. Sufficient illustration is given of the various methods employed to show the nature of the jobs which are available for young men in the foundry.

Vote of Thanks

MR. W. BROWN proposed, and MR. F. D. WEBB seconded, that a very hearty vote of thanks be accorded to Mr. Hudson for the film. Mr. Webb added that, as secretary of the Manchester and District Ironfounders Employers' Association, he endorsed everything Mr. Hudson had said in his opening remarks about the use and the value of the film for the purpose of training and recruitment. During the past 12 months he had spent a considerable time showing American foundry films which had been brought to this country last winter. These had been very much appreciated by large audiences often comprising skilled craftsmen. He had a film in the course of preparation. Owing to pressure of work its production had been somewhat delayed but it was hoped it would be completed in the spring of the present year and could be shown during the next session.

Discussion

The CHAIRMAN desired to know how many hours filming was necessary in order to produce a 40-minute film; how many feet of film were used, and how much time was spent on editing. He would be very interested to learn how the indoor shots in colour had been achieved. It would be necessary to have strong lighting and special lenses with wide apertures would have to be used for colour rendering.

MR. HUDSON could not state the precise number of hours which were spent on filming. Most of the time was taken up in planning the film, because everything had to be "cut and dried" beforehand with regard to the arrangements of sequences, the preparation of the commentary and the editing of the film, etc. There were 2,000 feet of film taken, and approximately 1,400 feet had been used.

It could be recalled that the previous summer was a particularly fine one and full advantage was taken of the brilliant light which was available for the taking of inside work, augmented by a certain amount of artificial illumination. The additional light was provided by six No. 2 photo-floods. Lenses employed had an aperture of F1.9.

"*Bronze Founding*" Film

MR. E. LONGDEN wished to know what had happened to a previous film made and commented upon by Mr. Hudson dealing with "Precision Castings"?

MR. HUDSON replied that the film, entitled "Precision Casting," was still being exhibited, and copies had been sent to France, Italy, Australia, and U.S.A.

MR. F. A. HARPER asked if the 16 mm. film could be shown in an ordinary cinema?

MR. HUDSON said that a 16 mm. film could be shown in cinemas which had a 16 mm. projector in their projection room, and which could show sub-standard-size films. Alternatively, a 35 mm. copy could be made from the 16 mm., but not in colour.

MR. H. HAYNES stressed the importance of recruiting youths into the industry by means of film propaganda. He thought Mr. Hudson should have depicted wrong as well as right methods of moulding, casting, etc.

MR. HUDSON replied that the film had been made to create general interest, and therefore a target of 30 min. running-time had been set. Many things had to be excluded. It was hoped, in the near future, that training films could be made dealing with specific subjects which would be of interest to boys after they had entered the foundry; the present film was designed to try and get a lad into it.

Comparative Data

MR. N. SCOTT mentioned that the firm with which he was associated had employed professional people to make a film of the foundry. The time occupied was eight weeks, and thousands of feet of film were exposed. The result was a film of 20 minutes showing, which cost approximately £4,000. Mr. Hudson was to be complimented on the way he had taken his shots and on the small percentage of waste film, and certainly the synchronisation of the commentary was very good. He thought professional commentators were not always the ideal choice for such films, and perhaps it would be better for, say, a foundryman to speak.

MR. HUDSON was, up to a point, in sympathy with Mr. Scott's remarks concerning commentators, but suggested that a man with a local dialect might not be equally well understood by audiences in other parts of the country. Short training films, which would not have a very wide distribution, could be commented upon by local men. For films with a wide circulation the professional commentator was undoubtedly a valuable asset.

In reply to a query as to whether sound and pictures could be taken simultaneously on the 16 mm. film, Mr. Hudson replied this could be done by the use of expensive equipment. He had used a new magnetic tape recorder coupled with ciné film. The silent film and a recording was taken, and then reproduced on to a sound track.

MR. L. BROOKHOUSE, speaking as an engineer, felt that the moulder worked at a terrific rate, as shown on the film. Was that his usual speed, or was it accelerated by the camera?

MR. HUDSON explained that, owing to the fact that all the operatives were in the limelight, they would naturally enough work a little speedier than usual. Also, the shots in certain cases were taken at a normal 16 frames a second in view of deficient lighting. The film that evening had been projected at "sound" speed, which was 50 per cent. faster.

MR. F. BROOKHOUSE desired to know if the film would be available to elementary schools?

MR. HUDSON replied that any school could obtain a loan of the film from the Association providing the boys were nearing school-leaving age.

MR. TAYLOR thought much information could be obtained from a defective casting.

MR. E. A. LAMBERT pointed out that Mr. Hudson was the inspiration and virtual author of the publication entitled "Defects and Castings." It was hoped that the material contained in the book would be made into a film.

MR. HUDSON then referred Mr. Taylor to a sound film which had been made by High Duty Alloys, Limited, dealing with aluminium-alloy castings, and which was well worth seeing from the point of view of eliminating casting defects.

Research in Non-ferrous Metallurgy

The British Non-Ferrous Metals Research Association, which started on a small scale in 1921, has grown steadily and to-day it has a membership of just under 500. The annual income from all sources is just over £100,000 and the total staff 163. The increase in activities of the Association has hitherto generally kept in front of the expansion of the laboratory accommodation. This has now been remedied by the reconstruction and occupation of the original laboratory block which was destroyed in 1940. In rebuilding this block at Euston Street, London, N.W.1, opportunity has been taken to provide for metal-working equipment which the Association had previously lacked.

The premises were available for inspection by member firms last week after being opened on February 13 by Sir Ben Lockspeiser, secretay of the Department of Scientific and Industrial Research. There are, in all, four blocks, covering nearly 15,000 sq. ft. of site; most of the blocks are of four or five storeys, and the present floor space in use totals 45,000 sq. ft. The development of the rest of the site on adjacent property which is available for expansion at some future date will probably add a further 15,000 sq. ft. of usable floor space. The Association's first concern is research on the scientific background of the processes used in the extraction and manufacture of non-ferrous metals and alloys, and their selection for particular uses. From the user's point of view, the demand includes information on corrosion resistance—in this connection the laboratory has done some valuable work on anti-corrosion alloys for ships' piping—mechanical properties, and the development of special alloys.

New Flame Cutter

Some details have been received from the Buckle Flame Cutter Company, Limited, of 415, Oldfield Lane, Greenford, Middlesex, of a light-weight hand flame cutter. The patented features are contained within the main body and may be regarded as constituting two torches in one. In practice, it gives quick starting, for when the cutting lever is depressed, and the cutting valve is closed, the pre-heating oxygen and the fuel gas are each fed to the nozzle to its full capacity through separate balanced chambers. When the cutting valve is opened by releasing the lever, one each of the pre-heating and fuel-gas channels is automatically closed and the nozzle is only supplied through the other channels. These are arranged to achieve neutral flame balance. The claims made for the economies resulting from the use of such a cutter are of such a character that their fulfilment would indeed be valuable to the foundry industry—especially the steel castings section, where so much scrap has to be prepared and runners and risers removed by flame cutting.

Foundry Coke Merchants' Association

Annual Dinner

The Foundry Coke Merchants' Association held a dinner at the May Fair Hotel on Februay 10, Mr. Arnold Carr presiding. Following the honouring of the Loyal Toast, MR. LESLIE O'CONNOR, proposing the toast of "The Foundry Industry," said he felt delighted and honoured to be called on to propose that toast. He was delighted because he felt that their finances were interlocked. If the foundry industry was prosperous, then the foundry-coke trade was healthy and prosperous. As they were no doubt aware, the National Coal Board supplied practically all the foundry coke in the country. Last year, he believed, they reached a figure in the neighbourhood of a million tons, and he had been very gratified to see in reports that the foundry industry had in 1949 broken all records for output of iron castings. He had to confess that the Coal Board had some difficulty in meeting the full requirements of the trade in foundry coke, but the fact that records were broken showed that they did not do so badly after all.

As regards shortage of supply, he had noticed one strange thing about the foundry industry. He found industries generally had different methods of complaining. Some of them were very sarcastic and addressed themselves to the "Head of the Slate Board," or something like that. Others sent in long memoranda, and yet others asked whether it was quite certain that, to repeat an old "crack," the "Coal Board had left no stone unturned," and so on. But with foundrymen there seemed to be a telegram mentality. They had the habit of sending telegrams—most dramatic things, too. "Unless 500 tons immediately dispatched Welsh Navigation superior coke work stops tomorrow shortage of dollars and all the rest of it." The Board was helping the drive for increased production by installing new ovens. A new plant was envisaged for South Wales and a second for Durham. There was just one point he would make, with their permission. It was that, as he thought most people knew, the coal which went to produce the foundry coke was most difficult to win and the most expensive to produce. The coal price structure of the National Coal Board would eventually have to reflect that fact. Without wanting to teach them their business in any way whatsoever, it might be worth their while to see whether it was at all possible to utilise a foundry coke perhaps not of the same quality, but perhaps of a lower cost. The British Coke Research Association and the British Cast Iron Research Association were getting together and seeing what could be done to produce the material which they required. He thanked the company for all the help that they had given in distributing the foundry coke which had been available.

Mr. N. P. Newman's Reply

MR. NOEL NEWMAN, J.P., President of the Institute of British Foundrymen, responding to the toast, said he was very glad Mr. O'Connor had referred to the record output of the iron-founding industry of 1949, because they were very proud of it. He would add that it might have been even higher if the coke had been better! He thought that, prewar, founders could place reliance on two factors—the quality of their coke and the quality of the pig iron. So, to-day, when materials were so unreliable, it was much more difficult to achieve a record, and he thought they had something to be proud of.

Whatever the foundry industry might think and say of coke, he thought it had to be realised in all fairness to the industry that they did realise the difficulties which the Coal Board had in producing the goods which they required. It was up to the foundry industry to put themselves in a position where they could use what the Coal Board could supply. It was perhaps very easy to make a complaint which was not justified, but if they could work together they might again beat the record of 1949.

"The Guests"

The CHAIRMAN (Mr. Arnold Carr), proposing the toast of "The Guests," mentioned that that was the first function of its kind that they had had since the formation of the Association eight years ago, and in addition to extending a hearty welcome to all their guests, he was glad to see so many members present. He gave a "potted" biography of each guest allocated to the high table and finally cordially thanked Mr. F. Arnold Wilson for having so successfully carried through the onerous task of organising this function.

MR. BARRINGTON HOOPER, C.B.E., proprietor of the FOUNDRY TRADE JOURNAL, who replied to the toast, said he would like to pay a tribute to the services of the foundry-coke supply industry during the war. He had been told that in no case was a furnace temporarily shut down during that difficult period on account of non-delivery of coke. It was to be hoped that, despite the changes that had taken place in the political aspect of supply and distribution, that achievement would be accepted as a tribute and as an inspiration.

"The Association"

MR. J. Y. FEGGETTER, proposing the toast of the "Foundry Coke Merchants' Association," said it was a great pleasure to be with them and to have that task to perform, not only because of his connection with the foundry merchants since the inception in 1942, but also because he had been associated with the London foundry coke merchants when they were formed in 1939. It also gave him the opportunity of publicly congratulating on their behalf his old friend, Mr. Arnold Carr, on his recent appointment to very high spheres in his own company.

The main object of the Association was to promote in every way the development of the use of coke for the foundry industry, and they regarded that as absolutely identical with their object as producers. When listening last year to a lecture by Dr. Mott he heard the lecturer say that foundry coke was in relation to furnace coke like a tailor-made suit in relation to a ready-made suit. So they could consider themselves as being in the bespoke department, and they should try and fit the "cloth" of the coke to the requirements of the industry foundry. He was surprised that Mr. O'Connor had not mentioned that, of the million tons supplied to the foundry industry, 70 per cent. was supplied through merchants.

MR. J. J. SELBY, whose name was coupled with the toast, said in reply that they recalled with pleasure the delight with which, eight years ago, they entered into the first pleasant relations with the coke producers. These were then trading, of course, as individual companies. They recalled, also, that special credit was due to the producers for their strenuous efforts in those wartime days in supplying coke to enable their foundry customers to play their part in winning the war.

Then, in the passing of time, there came that change which put them in the position of being joint owners of the coke ovens and brought into being a company of friends, many of whom they were delighted to have with them on that occasion. That no foundry had been let down by reason of a lack of coke supplies was due in

Foundry Coke Merchants' Dinner

considerable measure to the fine co-operation that had been at all times shown by coke-supply officials, or by them and Mr. Leslie O'Connor and the officers of the Ministry of Fuel and Power. He would also like to add a few words with regard to the leadership which had been exercised by their good friend and colleague Mr. Arnold Carr.

Between the speeches, the company was entertained by Flotsam and Terry Thomas.

Mond Nickel Fellowships, 1950

The Mond Nickel Fellowships Committee now invites applications for five Fellowships of average value of £750 each for 1950. Fellowships will be awarded to selected candidates of British nationality with degree or equivalent qualifications to enable them to obtain wider experience and additional training in industrial establishments, at home or abroad, to make them more suitable for future employment in senior technical and administrative positions in British metallurgical industries. Each Fellowship will cover one full working year. Applicants will be required to state details of the programme they wish to carry out. Particulars and application forms are available from the Secretary, Mond Nickel Fellowships Committee, 4, Grosvenor Gardens, London, S.W.1. Completed application forms are required by June 1.

EXTERNAL APPEARANCE OF A "COMBINATION" STOVE FOR USE IN KITCHEN/LIVING ROOMS, THE 1949 WINNING ENTRY, SUBMITTED BY MR. BRIAN ANTHONY MANN, IN THE DOMESTIC SOLID-FUEL-BURNING-APPLIANCES SECTION OF THE INDUSTRIAL ART BURSARY COMPETITION ORGANISED BY THE ROYAL SOCIETY OF ARTS.

Tax on Preference Dividends

A decision of the Court of Appeal on February 15 that the practice previously adopted by Vickers, Limited, and the Austin Motor Company, Limited, in calculating those preference dividends which are tax free up to 6s. in the £ was correct, means that dividends on these stocks are subject to tax at the difference between 6s. and the standard rate—*i.e.*, 3s. on the nominal dividend only—and will in future be paid on this basis.

The decision reverses that given in the High Court last February in respect of a similar preference stock of Godfrey Phillips, Limited, the tobacco manufacturers. The Court then approved this company's practice of first grossing up the nominal dividend (6 per cent.) at 6s. in the £. On this gross amount, the tax was calculated at 3s. in the £. This tax was then deducted from the nominal dividend of 6 per cent., and the balance paid to the stockholder as the net dividend. The method approved last week gives a holder of a 6 per cent. stock approximately 7s. 8d. per cent. more in net dividend.

Following the Godfrey Phillips' decision, the Austin Motor Company, Limited, and Vickers, Limited, adopted this company's practice for their last two instalments of dividend pending the Court of Appeal verdict. Both the Austin Motor Company in respect of its 6 per cent. "B" preference stock, and Vickers, Limited, in respect of its 5 per cent. cumulative preference stock, are to pay to holders the difference between the two methods of calculation in respect of the last two instalments of dividend. These will be paid to holders on the registers at the time of the next dividend payment.

IMPERIAL CHEMICAL INDUSTRIES, LIMITED, publish new technical literature at the rate of 800 publications per year, and from two to four million copies are printed annually. The exhibition of I.C.I. technical literature which the company held, primarily for their own head office staff, in London last July, aroused considerable public interest and it has been decided to restage it in larger and more popular form at the Academy Cinema Exhibition Hall, Oxford Street, London, W.1, from March 6 to 17.

THE GLACIER METAL COMPANY, LIMITED, manufacturers of plain bearings, have embarked on a comprehensive standardisation policy that has so far resulted in the marketing of a standard range of steel-backed, lead-bronze-lined wrapped bushes, a range of strip-type, white-metal-lined half bearings of the type used almost universally for the engine bearings of motor cars, etc., and a standard range of bronze bars for those who machine their own bearing products. It is interesting to note that the company, in deciding on the general need for plain-bearing standardisation, was able to cite in support the fact that at any given moment over 3,000 different types of plain bearings and bushes are going through their factories, all to customers' individual designs.

The company now announce the availability of another standard bearing product—Glacier standard bronze bushes. These bushes are offered in 191 standard sizes from ¼ in. to 2½ in. bore with varying lengths for each bore size. They are cast in a lead-bronze specification metal which it is claimed possesses certain advantages over the harder phosphor bronzes. It is well known that lead bronzes possess better anti-frictional properties than phosphor bronzes, although in general they have a lower mechanical strength.

Correspondence

[We accept no responsibility for the statements made or the opinions expressed by our correspondents.]

ALUMINIUM CHILLS FOR LIGHT-ALLOY CASTINGS

To the Editor of the FOUNDRY TRADE JOURNAL

SIR,—May I encroach on your columns to endorse the remarks of Cartwright in your issue of February 2 in connection with the merits of aluminium chills for aluminium-alloy castings?

In my experience, these are entirely satisfactory for jobbing work, though there is a disadvantage to continuous-production foundries in so far as they do not respond to magnetic attraction in recovery systems. Their durability under the action of liquid aluminium is verified by the fact that aluminium can be used as a permanent-mould material for the rapid production of simple shapes in cast alloys of the same or other composition.

This practice can be used to advantage for the production of chills for use in sand moulds of the type described by Wilson and Talbot. For best results, the face of the chill should be grooved to allow for the escape of air at the metal-mould interface as shown in Fig. 1(a). The manufacture of an aluminium mould is quite simple and starts from a replica in wood of the required chill. Plaster of paris is poured around this to form a pattern of the actual mould, which, when hard, is used for making sand castings in aluminium alloy, cast to size and shape and ready for immediate use. If necessary, two or three such moulds can be made at the same time for subsequent use in series, when casting the chills.

An outline of a mould suitable for the type of chill in question is given in Fig. 1(b). Sprigs should be inserted when the metal is liquid, to act as anchors in the green-sand mould. The use of such chills results in over-all economies, speedy preparation of moulding methods for the aluminium foundry, and greater reliability in behaviour compared with iron chills; also, the reduced weight of burden in green-sand moulds is important.—Yours, etc.,

M. R. HINCHCLIFFE
(G. & J. Weir, Limited).

Cathcart, Glasgow, S.4.
February 6, 1950.

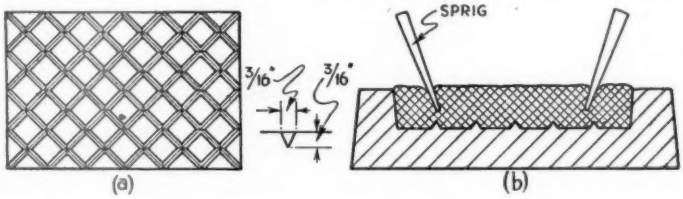

FIG. 1.—(*a*) FACE OF ALUMINIUM CHILL, GROOVED FOR THE ESCAPE OF AIR. (*b*) PLASTER CAST USED FOR MAKING ALUMINIUM CHILL. SPRIGS ARE INSERTED SUBSEQUENTLY, FOR ANCHORING THE CHILL INTO A SAND MOULD.

Book Reviews

The History of Engineering in Ipswich. Compiled by the Ipswich Engineering Society and published by W. S. Cowell, Limited, Butter Market, Ipswich. Price 10s. 6d.

The reviewer can think of nothing more appropriate for the celebration of the jubilee of a local engineering society than the publishing of a book containing the history of their own progress and of the industries which they serve. The town of Ipswich now employs 10,000 in its engineering industry, which was started in 1789 when Robert Ransome, of Norfolk, started a foundry with one man and a capital of £200—a considerable sum of money in those days. The book, in an extremely interesting manner, reviews the history of the town from the Roman occupation, the decline of business after Norman invasion, the granting of its charter in 1199 by King John, the monasteries, the trade guilds, the creation of a local press—the "Ipswich Journal" in 1920, shipbuilding, bell founding, and education. It is interesting to note that the fees in 1482 for tuition at the local Grammar School were 8d. a quarter, but they were a different sort of pennies in those days. Surely the oldest foundry institute in the world must be the "Orwell Works' Foundry Society," founded in 1836 to "develop religious, moral and intellectual culture. Initially it had 50 books, and by 1866, 2,922, but by then it was absorbed by the Mechanics' Institute. All this and much more information is given in Chapter I, and those which follow cover the port, sewerage and sewage disposal; transport, the fire brigade, and the gas company. The balance of the book—Chapters VII to XVII—outlines the history of the district engineering works. Without being invidious, that of Ransomes, Sims & Jefferies, Limited, is the most interesting because of its age and the variety of products it has manufactured—ranging between lawn mowers and aeroplanes (one of the latter is credited with the shooting down of a Zeppelin near the town). Other foundries included in these surveys are E. R. & F. Turner, Limited, and Bull Motors; Ransomes & Rapier, Limited; Reavell & Company, Limited; Manganese, Bronze & Brass Company, Limited; Crane, Limited, and the Suffolk Iron Foundry (1920), Limited. The original design of the last-named foundry won a £50 prize offered by the FOUNDRY TRADE JOURNAL to its originator, Mr. L. J. Tibbenham. He nearly lost it by the poor siting of his pattern stores. However, the reviewer has heard of no fire breaking out. There is just one lapse in this book—and that is that no index has been incorporated. The reviewer suggests that readers who are interested in the history of their craft, both at home and abroad, should buy this book. It is very good value for money. V. C. F.

Warne's Metric Conversion Tables. Compiled by Otto Klein. Published by Frederick Warne & Company, Limited, Chandos House, Bedford Court, Bedford Street, London, W.C.2. Price 15s. net.

This book includes 80 tables for the conversion of metric and American weights and measures into British units and *vice versa*. There is one table the reviewer would have liked to see incorporated and that is pounds to tons, as the Americans always designate strengths by lb. per sq. in. and the British tons per sq. in. Dividing by 2,240 can be time wasting. The tables published, however, do cover a wide field and can be recommended as real timesavers.

Overhanging Core Prints Stop Wasters

By "Checker"

Insufficient or incorrect core prints can sometimes be the cause of castings being scrapped for uneven metal thickness. When this happens, some alternative arrangement of printing must be employed to carry the core satisfactorily. Fig. 1 (*a*) shows a small three-way connection pattern as supplied by the customer, complete with core prints 1¼ in. dia. at the large end, and ¾ in. dia. tapered to ⅝ in. dia. at both flange outlets. This resulted in a varying thin metal section being obtained on the underside, shown at "X," caused by the inability of the two small prints to give the firm and solid seating which was necessary for the core.

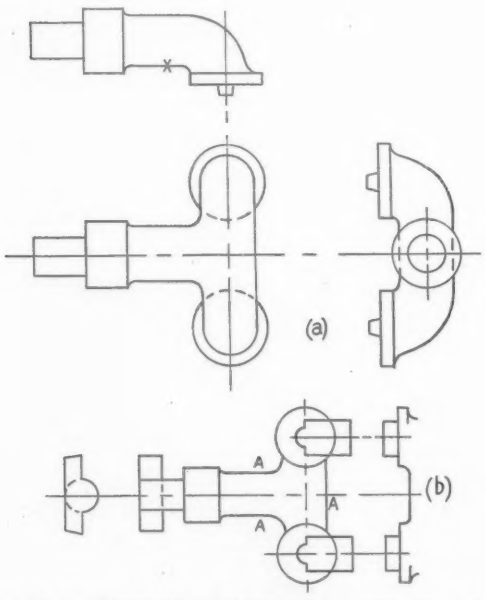

FIG. 1.—THREE-WAY CONNECTION PATTERN WITH (*a*) SMALL PRINT SURFACES, AND (*b*) AS MODIFIED, WITH OVERHANGING CORE PRINTS.

Obviously, these small print surfaces had to be increased, in such a way as to give a more substantial seating. For this purpose, it was decided to incorporate overhanging core prints at both flange outlets and to mould the pattern the opposite way, with these uppermost. Also, an extension was added to the larger print giving a flatter and larger seating than before. These core prints are shown in Fig. 1 (*b*). After the print alterations had been carried out to both pattern and corebox, the castings obtained were satisfactory in uniformity of metal thickness. Accurate core setting was achieved by gauging the metal thickness at parts marked "A."

SIR JAMES LITHGOW, Bt., has resigned from the board of G. M. Hay & Company, subsidiaries of British Polar Engines, Glasgow, and Sir John Duncanson has joined the board.

Trade Practices

Measures continued by Orders in Council

By F. J. Tebbutt

A feature of the Emergency Laws (Miscellaneous Provisions) Act, 1947, is that, as time advances, various provisions of the Act cease to have effect, most of these being time-limited to expire at different dates, but the following is an interesting point to note. Any Act, Rule or Order covered by this Act can be continued beyond the expiration date by an Order in Council, but the order must be laid before both Houses of Parliament. On the other hand, by a somewhat similar measure (the 1946 Act which is in associate relationship with the Act under review) an Order in Council can be issued to provide for the expiration of any provision, regulation, enactment, etc., under these Acts, before the date stipulated as the ending date.

Under the 1947 Act under review there has recently been issued an Order in Council (made December 16, 1949) which provides for the continuation of one Act and one Regulation until December 10, 1950, this Act being the Restoration of Pre-war Trade Practices Act, 1942, and the regulation No. 76 of the Defence (General) Regulations, 1939. The 1942 Act imposes an obligation on employers to restore or permit any trade practice in operation at the start of the last war (*i.e.*, September 3, 1939, or if the firm was then on war munitions, April 30, 1939), which has been departed from since, within two months after a date to represent the end of the war. For this Act, the "end-of-the-war" date was to be a date appointed by the Minister of Labour, but up to now this date has not been definitely applied. The history of this is that the first date through the 1947 Act was scheduled as December 31, 1948, but a subsequent Order in Council altered this to December 31, 1949, and now the Order in Council under review makes the date December 10, 1950, which means that any war-time practice can be continued throughout most of this present year. The term "trade practice" for this 1942 Act (continued), means any rule, practice or custom (whether by contract of employment or otherwise) observed in the particular industry as regards the persons to be employed, conditions of employment, etc., but not wages. Matters covered are such things as daily hours, working week, as for example whether five or six days; overtime matters; boys, girls or women for certain jobs or as substitutes for men; dilution matters generally; definition of operations, as example whether considered skilled or semi-skilled and so forth; processes to be followed according to age, experience, etc.; apprenticeship matters, etc.

It may be, of course, that a war-time practice is one which it is thought should be retained, and it is permissible by the 1942 Act (continued) for agreements to be made between trade unions and employers' associations to this effect, but the trade union must be one which was concerned with the particular industry in relation to the matters under review.

AN EXHIBITION entitled the "Latest Products Section" was opened in the Engineering Centre, Glasgow, last Friday, by Mr. Bruce Ball, vice-chairman of the Centre. This section will exhibit only the very latest engineering products of British industry. Each item will be shown for a month only, and the Centre will make the utmost effort to obtain new products as soon as they are announced.

French Scientific Instruments

Exhibition in London

It has long been felt that British scientists would welcome an opportunity of seeing at first hand some of the tools of foreign research they had for so long been able to study only on paper. This has now been made possible at the exhibition of French Scientific instruments which opened on February 9 at the Science Museum, London, and closes on February 26. Material for the exhibition has been provided by several French official bodies—the *Centre National de la Recherche Scientifique, the Office Nationale d'Etudes et des Recherches Aéronautiques*, the *Institut Français du Pétrole* and the *Commissariat à l'Energie Atomique*—and by a number of French instrument manufacturers. Additionally, a number of lectures have been given, one being of special interest to metallurgists—"Some French Apparatus for Use in Metallographic Research," by P. Chevenard.

Among the instruments shown, some of those of use for metallurgical research are listed below:—

Micro-tensile machines are shown, suitable for tensile tests on thin wires or strips. Using Chevenard's system, they draw a graph on a photographic plate or paper, of the force as a function of the elongation as applied to a wire stretched at constant speed until fracture. The speed of elongation may vary between 1 and 300 mm. per min., and a series of 13 springs enables loads of from a few grams to 100 kgs. to be used.

An improved differential dilatometer for mechanical recording, with a device for investigating isothermal hardening is shown.

A "T.R." machine for the study and recording of creep in metals, using the Chevenard and Joumier process, has been designed for recording characteristics of hot-working alloys and investigation of creep problems. This is not on show, but photographs of results obtained with the equipment are available.

A spark generator with control for quantitative analysis and arc generators for spectrographic analysis are exhibited.

A gas analyser for detection and analysis of CO, CO_2, H_2S, NH_3, HCN, etc., is demonstrated. The principle depends on the selective absorption of infra-red rays by gases. The apparatus is arranged to provide instantaneous and continuous automatic readings.

An attachment for converting an ordinary microscope into a phase-contrast microscope, the invention of Monsieur Francon, is exhibited. Other types of microscope are also shown.

The organisers of the exhibition do not suggest that all the apparatus on view is entirely new to British industry. The purpose of the exhibition is rather to stimulate discussion and further interchange. If it appears that British and French scientists arrive at the same results by different means, working independently, it is evident that there is room for further collaboration. If, on the other hand, they find different solutions to the same problem, it is evidence of the value if frequent interchange of views.

AUSTRALIA is considering sending a mission to the United Kingdom to endeavour to attract technical men, particularly engineers and architects. Announcing this, Mr. R. G. Casey, Minister for Works and Housing, said that the rapid development which he foresaw for Australia offered excellent opportunities for such men.

Lack of technical staff, he added, was holding up much important development work that State Governments wished to carry out. Excellent work was being done by those who had come to Australia as a result of previous inquiries.

Siliceous Parting Powders

Towards the end of 1945 the Minister of Labour and National Service published a proposal to make regulations prohibiting the use in foundries of parting powders or parting sands containing more than 3 per cent. of compounds of silicon calculated as silica. The object of the proposal was to reduce the risk of silicosis among foundry workers, and it took into account a recommendation made in 1944 by the Committee on Dust in Steel Foundries, on which both sides of the industry were represented.

A number of objections were lodged to the draft regulations of 1945; and the matter has since been exhaustively discussed by the Factory Department with technical experts connected with the industry, taking more recent developments into account. It appears that strict compliance with the prohibition proposed in the 1945 draft Regulations would not be reasonably practicable, at any rate in present circumstances, unless there were exemptions providing for the use of natural sands and of certain substances (*e.g.*, sillimanite, zirconium silicate, calcined fireclay, calcined aluminous fireclay and calcined or fused alumina), which contain—or may contain—substantial percentages of compounds of silicon other than "free silica."

The Minister accordingly proposes now that Regulations should be made on this basis and he has published revised draft regulations entitled the Foundries (Parting Materials) Special Regulations, 1950 (H.M. Stationery Office, 1d.). In accordance with the statutory procedure, any objections to the draft regulations by or on behalf of persons affected must be sent to the Minister on or before April 15. Any objections must be in writing and must state:—(*a*) the specific grounds of objection; and (*b*) the omissions, additions, or modifications asked for. Objections may be addressed to the Secretary, Ministry of Labour and National Service, 8, St. James's Square, London, S.W.1.

New Catalogues

Carbide Tipped Tools. A very interesting catalogue has just been issued by A. C. Wickman, Limited, of Tile Hill, Coventry, carrying the title of Wimet Standard Tools Manual. It is a veritable textbook on the subject and, as such, can be sure of a warm welcome from the trade. Being interested in colours, the reviewer was somewhat shocked to find a "shot-blast" grey. As a stamp collector he is constantly finding weird and wonderful adjectival additions to colours, and can only imagine that in this case there must be some association of ideas with the brand of tool to be used "on steel castings with sand inclusions." The illustrations, which are profuse, are particularly clear and informative. The tabular matter has been well chosen and clearly printed. It takes over a hundred pages to cover the subject and no space has been wasted on "display." The reviewer compliments the publicity officers responsible for this catalogue.

Furnace. Sklenar Furnaces, Limited, of East Moors Road, Cardiff, have issued a four-page leaflet which describes a furnace—Type 50/150—having a capacity of 100 lb. of copper alloys or grey iron or 50 lb. of aluminium. This leaflet carries a really high advertising value, as the various selling points are properly stressed. For instance, there appears in bold red type the statement "400 melts can easily be obtained from each lining—to re-brick only costs the same as 3 crucibles." As a simple leaflet it is a very creditable production.

News in Brief

A NEW CANTEEN has been opened at the Rotherham works of Gummers, Limited, brassfounders and valve makers.

THE ROYAL STATISTICAL SOCIETY has received an anonymous benefaction of £30,000 to enable it to acquire premises worthy of its history, traditions, and scientific work.

TYNEMOUTH INDUSTRIALISTS are to present a silver mace to Tynemouth Corporation as a token of the good relations existing between the local authority and industry.

FIVE EMPLOYEES OF R. Taylor & Sons, Muirhead foundry, Larbert, have each been presented with a cheque for £25 on completing 25 years' service with the firm.

TO CELEBRATE the 160th anniversary of their establishment, the Butterley Company, Limited, entertained 1,500 of their employees by a visit to the pantomime at Derby.

THE RECENTLY-DISCOVERED iron-ore properties of the United States Steel Corporation in Venezuela are stated by the American Institute of Mining and Metallurgical Engineers to be the richest in the world. More than 1,000 million tons of ore have already been proven.

MODERN MACHINE TOOLS will be offered for sale by auction at the Ministry of Supply Depot, Daimler No. 2 Factory, Allesley, near Coventry, on March 8. Catalogues of the sale (6d. each) may be obtained from the auctioneers, Edwards, Son, Bigwood & Mathews, 158, Edmund Street, Birmingham.

OUTBREAKS OF FIRE have occurred at two Sheffield works recently. The first was in the patternshop of William Green & Company, Limited, ironfounders, of Ecclesfield; floorboards and joists were damaged. The second, at the Hallamshire Steel & File Company, Limited, occurred in the furnace-shop roof; damage was only slight and the men continued working.

HEAD WRIGHTSON ALDEAN, LIMITED, subsidiaries of Head, Wrightson & Company, Limited, engineers, etc., of Thornaby-on-Tees, have been entrusted by the Aberdeen Harbour Board with an £88,000 contract for a new aluminium bridge of the bascule type for the Victoria Dock. It has a clear opening of 70 ft. and will carry two lines of road traffic and one of rail traffic.

THE NAME OF "Eugène Ronceray" is to be perpetuated by giving his name to a room to be used by fourth-year students of the *Ecole Nationale d'Arts et Metiers*. He was the first director of the French Foundry High School and this action will serve not only as a reminder of his great work, but also as propaganda for the school. The *Association Technique de Fonderie* has given 50,000 francs towards this object.

MITCHELL, RUSSELL & COMPANY, LIMITED, Chattan Foundry, Bonnybridge, who were incorporated on February 19, 1929, celebrated their 21st birthday at a dinner in Falkirk on February 21, attended by senior staff and their wives. Approximately 120 persons were present at the function, 25 of these being staff who had been in the company's employment since its inception. "The Company" was proposed by Mr. Hugh Richmond, M.A., C.A., and was replied to by Mr. J. D. Russell, A.C.A., director, son of the late chairman of directors. "The Staff" was proposed by Mr. T. B. Preston, joint managing director, and replied to by Mr. A. G. Goodwin, chief draughtsman. The toast to "The Chairman" was proposed by Mr. R. W. Fovargue, who referred to Mr. Mitchell as the first managing director of the company and now chairman and joint managing director. Other directors present were Mr. R. G. Gillespie, who is London manager for the company, and Mr. R. R. Fyfe Smith.

Industrial Accidents

Further extracts from the 1948 *Annual Report of the Chief Inspector of Factories*

Cranes

Discussing certain classes of accidents, the Inspector of Factories points out that the greatest number of accidents in connection with the use of cranes was again caused by bad slinging or inefficient signalling. Incorrect methods and insecure attachment of slings were responsible for 90 per cent. of the 652 accidents (14 fatal) in which the load or part of the load fell and struck someone. Lack of care in arranging or attaching slings coupled with poor methods of signalling were largely accountable for the 354 accidents in which hands or fingers were trapped between the load or hook and the sling. Such accidents are by no means trivial and often involve finger amputations. There were 48 cases of cranes being overturned, causing four deaths. Twenty-six of these occurred with mobile jib cranes, but it is doubtful, states the Inspector, whether this figure represents the total number of cases of overturning in which mobile jib cranes were involved. It did not seem to be appreciated generally that the collapse or failure or the overturning of a crane was reportable regardless of whether the occurrence causes death or disablement or not. Several such omissions had come to notice.

Referring to conveyor accidents in factories, the Inspector emphasised that conveyors, like most other machinery, had their dangerous parts and the desirable effect of their adoption in reducing non-machinery accidents might be nullified if the machinery accidents rose in consequence. There appeared at present to be no serious cause for alarm as far as numbers of accidents were concerned, but the seriousness of many of the injuries demanded that effective steps be taken to provide secure fencing for all the known dangers.

Molten Metal

During 1948, accidents due to molten metal numbered 1,971. Discussing these, the Inspector points out that an examination of reports showed that 40 per cent. of them involved injuries to the feet and ankles, 25 per cent. to the eyes and 10 per cent. to the hands. The necessity for adequate protection for these parts of the body, he states, was obvious. The accidents were as follow:—Molten iron in ironfoundries, 1,005; at blast furnaces, 35; molten steel in steelfoundries, 34; steelworks, 100; molten aluminium, 144; molten brass, 50; molten copper, 18; molten lead, 47; molten tin, 20; molten zinc, 72; other non-ferrous alloys, 222; molten slags, 150; die casting, 74. The accidents due to hot and corrosive substances, states the Inspector, represented a substantial fraction of the total accidents happening in factories and they could be reduced without any appreciable financial outlay.

General

Commenting on working conditions in works and factories, the Inspector recalled the fact that production and safety frequently went together, citing examples as indicative of the progress being made in the iron and steel industry. Numerous cases existed showing how mechanisation in the iron and steel making industries had improved working conditions by reducing the exposure to heat and the physical effort required from the workers.

Obituary

MR. HARRY WILLIAM MOBBS, chairman of Mobbs & Lewis, Limited, boot and shoe machinery manufacturers, etc., of Kettering (Northants), died on February 9. He was 90.

MR. JOHN CURRAN, who died recently, was managing director of Edward Curran & Company, Limited, enamelled steel hollow-ware manufacturers, structural engineers, etc., of Cardiff, and their associated companies.

MR. HUGH ALEXANDER HALDANE MCGILL, who died suddenly on February 5, was a director of Textile Machinery Makers, Limited, Oldham, and managing director of Platt Bros. (Sales), Limited, one of the company's subsidiaries.

MR. ALFRED W. A. HERRON, a blacksmith at the Arbroath works of Keith Blackman, Limited, engineers, etc., died on February 9. He was 79. Mr. Herron patented the guying screws for aircraft, which enable planes to be tied down after landing.

MR. CHARLES EDWARD BRIDGEWATER, who has died at Cradley Heath at the age of 92, last year celebrated 80 years on the pay-roll of Miles, Druce & Company, Limited, iron and steel stockholders, of Acton, London, W.3. For many years he was in charge of the firm's Netherton warehouses.

MR. HARRY CROXTON LOVING, who has died after a short illness, was formerly chief engineer at Sheffield of Cammell Laird & Company, Limited. On the formation of the English Steel Corporation, Limited, and the consequent fusion of the steel interests of Cammell Laird & Company and Vickers, Limited, Mr. Loving was appointed chief engineer of the Corporation. Later he was appointed chief engineer of a steelworks in India. For a period during the war he served with the Ministry of Supply. He has been living in retirement at Beneden (Kent).

Wills

DUGGHA, G. R., retired iron merchant, of Plymouth £16,291

ROBSON, J. T., formerly secretary of Head, Wrightson & Company, Limited, engineers and founders, etc., of Thornaby-on-Tees £1,138

WASHBOURN, S. E., governing director of P. Wilkinson & Sons, Limited, non-ferrous metal merchants, of Tottenham Street, London, W.1 ... ... £34,275

PRICE-JONES, EDGAR, a director of Metropolitan Gas Meters, Limited, Nottingham, and late managing director of Alldays & Onions, Limited, foundry and general engineers, of Birmingham £11,430

TATTERSALL, A. R., chairman of Groom & Tattersall, Limited, engineers and founders, etc., of Towcester (Northants), and of the Unique Charcoal Retort Company, Limited £30,073

Light Industries for Tees-side

Efforts by the Tees-side Industrial Development Board and the Tees-side Chamber of Commerce to diversify the industrial pattern of Tees-side by the introduction of varied light industries to safeguard against any possible future industrial depression were outlined at a joint Press conference of the two organisations in London last week.

It was stated that the area is at present experiencing what is probably the greatest concentration of new capital investment for industrial purposes in any area of comparable size in Britain. The known extent of this investment approaches £100,000,000, and is distributed over the major industries as follows:—Iron, steel, shipbuilding, and engineering, £23,900,000; chemicals, £32,126,000; other manufacturing industries, £11,163,000: service industries (including £16,000,000 on electricity supply development), £31,650,000.

Steel Industry's New Records

Good Start to the New Year

Steel production last month was at an annual rate of 15,873,000 tons, which was the highest rate ever achieved in January. Last month's rate compared with 15,002,000 tons in January, 1949, which was the previous best for the month of January. The figures for the first month of this year are especially noteworthy because output in the early part of January is always affected by the New Year holidays in Scotland.

A further production record was achieved last month, for the output in the closing week, at 328,100 tons, was 5,000 tons above the previous best weekly tonnage ever recorded.

The president of the British Iron and Steel Federation, Sir Ellis Hunter, in a telegram to each of the steel-ingot producers, said:—"I would like to congratulate all managements and men on continuing into 1950 the increasingly fine steel-ingot production records achieved by all with such consistency for so long a period." After referring to the record output in the closing week of the month, Sir Ellis added:—"I cannot let this occasion pass without expressing, through you, to all who serve in your company, my sense of the high value of their share in this great contribution to the country's needs."

Pig-iron output in January was at the rate of 9,742,000 tons a year, compared with 9,262,000 tons in January, 1949.

It will be recalled that steel output in 1949 totalled 15,552,000 tons, which compared with the previous record of 14,876,600 tons established in 1948. Pig-iron output last year was 9,498,500 tons, compared with 9,276,400 tons in the previous year. The latest steel and pig-iron output figures (in tons) compare as follow with earlier returns:—

	Pig-iron.		Steel ingots and castngs.	
	Weekly average.	Annual rate.	Weekly average.	Annual rate.
1950—January ..	187,400	9,742,000	305,300	15,873,000
1949—November ..	187,400	9,745,000	314,600	16,358,000
December ..	185,700	9,659,000	291,400	15,153,000

Welding Research in Industry

The growing application of welding to metallurgical fabricating industries increases in proportion the problems that arise when dealing with the various metals and structures. It is gratifying to feel that such problems are being vigorously investigated, both in laboratories and on site, by industry and the British Welding Research Association. The work of the B.W.R.A. was fully portrayed at an exhibition, "Research and Production," held recently at their headquarters, 29, Park Crescent, London, W.1. It has been restaged in Glasgow, at the Engineering Centre, Sauchiehall Street, from February 20 to 24.

BIRLEC, LIMITED, Birmingham manufacturers of industrial furnaces, announce the appointment of Mr. G. P. Tinker as managing director, in succession to the late Mr. A. G. Lobley. Mr. Tinker, a director of Birlec, Limited, since 1946, brings to his post an intimate knowledge and experience of the business, having been a member of the executive staff of the company since its formation in 1927.

Company Results

(Figures for previous years in brackets.)

ENGLISH CHINA CLAYS—Dividend of 4% (same).
METAL INDUSTRIES—Interim dividend of 3% (same).
STEEL & COMPANY—Interim dividend of 7½% (same).
H. W. LINDOP & SONS—Interim dividend of 35% (same).
STEEL COMPANY OF WALES—Dividend of 4% (same).
CONSETT SPANISH ORE—Interim dividend of 5% (nil).
M. MOLE & SON—Dividend of 10% (20% and bonus of 5%).
BENTON & STONE—Final dividend of 10%, making 15% (same).
THOMAS ROBINSON & SON—Final dividend of 5%, making 7½% (same).
GEORGE COHEN, SONS & COMPANY—Interim dividend of 8% (same).
BROWN BROS. & COMPANY—Final dividend of 10%, making 15% (same).
UNITED ENGINEERS & FOUNDERS—Dividend of 12½% and bonus of 5% (same).
WOMBWELL FOUNDRY & ENGINEERING COMPANY—Interim dividend of 6% (same).
HUMBER GRAVING DOCK & ENGINEERING COMPANY—Interim dividend of 2% (same).
NEEPSEND STEEL & TOOL CORPORATION—Interim dividend of 7½% on capital increased by 100% scrip bonus (15%).
GUEST KEEN BALDWINS IRON & STEEL COMPANY—Second interim dividend of 5%, making 10% to date (single payment of 10%).
HAMMOND LANE FOUNDRY COMPANY—Second interim dividend on account of a period of 15 months (nil), making 12½% to date (12½% for the year).
BURNELL & COMPANY—Final ordinary dividend of 22½%, making 30% (same); participating dividend of 7.1842d. per share on the 7½% cumulative participating preference shares (same).
INTERNATIONAL COMBUSTION (HOLDINGS) (formerly International Combustion)—Final dividend of 11% paid on increased capital, making 21% (final dividend of 27½%, making 37½%).
J. & E. HALL—Trading profit to September 30, 1949, £452,028 (£293,462); net profit, after depreciation, tax, etc., £113,831 (£90,051); final dividend of 7½%, making 10% (same); forward, £284,893 (£211,982).
MITCHELL, SHACKLETON & COMPANY—Trading profit for the year to September 30, 1949, £101,565 (£89,692); net profit, after depreciation, etc., £62,679 (£42,699); to subsidiary company purchase account, £12,093 (nil); reserve, £10,000 (£20,000); goodwill account, £546 (nil); dividend of 10% (8%); forward, £60,371 (£45,231).

New Patents

The following list of Patent Specifications accepted has been taken from the "Official Journal (Patents)." Printed copies of the full Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, price 2s. each. The numbers given are those under which the Specifications will be printed, and all subsequent proceedings will be taken.

622,741 ALLEGHENY LUDLUM STEEL CORPORATION. Method of increasing the high temperature strength of heat-resisting alloys.
623,193 ANGEL, E. G. R. Producing iron in pure or alloyed state.
622,983 SCOVILL MANUFACTURING COMPANY. Supporting and tilting apparatus for molten metal ladles.
623,231 MORTON, J. A., ANDREW, J. H., and PROTHEROE, H. T. Manufacture of iron, steel, and non-ferrous castings.
623,157 FOUNDRY SERVICES, LIMITED, and STRAUSS, K. Moulding materials.
623,164 WILD-BARFIELD ELECTRIC FURNACES, LIMITED, and MISRA, R. A. P. Heat treatment of ferrous materials.
623,305 BARTLETT, S. F. Manufacture of iron from iron ore.
623,314 UNITED STEEL COMPANIES, LIMITED, and PLUCK, J. E. Furnace roofs or arches.
623,360 HEPWORTH & GRANDAGE, LIMITED, and FORREST, H. Alloy iron castings.
623,548 BIRMINGHAM SMALL ARMS COMPANY, LIMITED, and OLIVER, D. A. Manufacture of metal articles.
623,577 POKORNY, E. A., and POKORNY, H. W. Process of recovery of hard metal carbides from sintered hard metal scrap.
623,651 MOREL, S. Devices for increasing the efficiency of sand-blast guns.
623,674 ELECTRIC FURNACE COMPANY, LIMITED, COSGRAVE, W. J. G. Heat-treatment, including quenching.
624,165 COLI, C. Process for the preparation of steel of high quality.
623,854 HARDY, INC., C. Powder metallurgy.
623,881 POTTS, F. C. (Linde Air Products Company). Refining of metal.

Increases of Capital

Details of increased capital have been announced by the following companies:—

CHAMBERLIN & HILL, LIMITED, foundrymen, etc., of Walsall, increased by £5,000, in 5s. ordinary shares, beyond the registered capital of £50,000.
DILWORTH & CARR, LIMITED, ironfounders, etc., of Preston, increased by £13,500, in £1 ordinary shares, beyond the registered capital of £13,500.
FOUNDRY EQUIPMENT, LIMITED, Leighton Buzzard (Beds), increased by £69,500, in £1 ordinary shares, beyond the registered capital of £15,000.
BAKER PERKINS, LIMITED, manufacturing engineers, etc., of Peterborough, increased by £530,000, in £1 ordinary shares, beyond the registered capital of £890,000.
CHARLES HAHLO & SONS (BRAZIL), LIMITED, ironfounders, etc., of Bradford, increased by £25,000 in £1 ordinary shares, beyond the registered capital of £25,000.
DOUGLAS FIREBRICK COMPANY, LIMITED, Kilwinning (Ayrshire), increased by £20,000, in 5s. deferred ordinary shares, beyond the registered capital of £40,000.
ADAMS & BENSON, LIMITED, iron, steel, coke merchants, etc., of West Bromwich, increased by £30,000, in £1 5 per cent. preference shares, beyond the registered capital of £85,000.
ALLEN WEST & COMPANY, LIMITED, switchgear manufacturers, etc., of Brighton, increased by £550,000, in 5s. ordinary shares, beyond the registered capital of £700,000.
FOUNDRY EQUIPMENT, LIMITED, Leighton Buzzard, increased by £65,500, in £1 5½ per cent. redeemable cumulative preference shares, beyond the registered capital of £84,500.
WOLVERHAMPTON DIE CASTING COMPANY, LIMITED, Wolverhampton, increased by £65,000 in 260,000 ordinary 5s. shares, beyond the registered capital of £130,000.
ROVAL, LIMITED (formerly International Corrodeless, Limited), treaters of metals, etc., of Enfield, increased by £30,000, in £1 shares, beyond the registered capital of £50,000.
NATIONAL STEEL FOUNDRY (1914), LIMITED, Leven (Fife), increased by £75,000, in 32,500 ordinary and 42,500 unclassified shares of £1 each, beyond the registered capital of £75,000.
LUKE & SPENCER, LIMITED, manufacturers of emery wheels, etc., of Broadheath, Altrincham, increased by £180,000, in £1 ordinary shares, beyond the registered capital of £20,000.
SMITH, PATTERSON & COMPANY, LIMITED, foundrymen, of Blaydon-on-Tyne, increased by £50,000, in £15 per cent. cumulative preference shares, beyond the registered capital of £150,000.
DANIEL ADAMSON & COMPANY, LIMITED, boiler makers, founders, etc., of Dukinfield (Ches), increased by £145,000 in £1 ordinary shares, beyond the registered capital of £150,000.
LANCASTER & TONGE, LIMITED, engineers, metal founders, etc., of Salford, 6, increased by £35,000, in 5,000 preference and 30,000 ordinary shares of £1 each, beyond the registered capital of £30,000.
GEORGE BLAIR & COMPANY, LIMITED, iron and steel manufacturers, etc., of Newcastle-upon-Tyne, 2, increased by £30,000, in 20,000 ordinary and 10,000 preference shares of £1 each, beyond the registered capital of £10,000.

Contracts Open

The dates given are the latest on which tenders will be accepted. The addresses are those from which forms of tender may be obtained. Details of tenders with the reference E.P.D. or C.R.E. can be obtained from the Commercial Relations and Exports Department, Board of Trade, Thames House North, Millbank, London, S.W.1.

ASHINGTON, March 28—Cast-iron street gullies, and manhole covers, for the Urban District Council. The Surveyor, Town Hall, Ashington (Northumberland).
CANNOCK, March 15—Castings, etc., for the Urban District Council. Mr. E. Lomax, engineer and surveyor, Council House, The Green, Cannock (Staffs).
DUBLIN, March 7—Supply of manganese steel forgings and castings, for the Port and Docks Board. The Engineer's Office, East Wall Road, Dublin.
HASLINGDEN, March 7—Iron castings, for the Borough Council. Mr. J. Mason, borough surveyor, Municipal Offices, Haslingden, Rossendale.
HEREFORD, March 7—Plant, tools, castings, etc., for the City Council. Mr. F. Margerison, city surveyor, Town Hall, Hereford.
MORLEY, March 4—Sewerage ironwork, for the Town Council. The Borough Engineer, Town Hall, Morley.
MORLEY, March 4—Sewerage ironwork, for the Borough Council. The Borough Engineer, Town Hall, Morley (Yorks).
OGMORE AND GARW (GLAM), March 20—Manhole covers and other castings, for the Urban District Council. Mr. W. T. Harris, engineer and surveyor, Council Offices, Brynmenyn (Glam).

STANTON-DALE

REFINED PIG IRON

Designed to meet the demands of high quality castings, which are, strength, machineability and resistance to wear.

All these can be secured by using Stanton-Dale Refined Pig Iron in your cupolas.

The above illustration shows a group of castings made by Messrs. Goodbrand & Co. Ltd., Stalybridge, Cheshire.

PROMPT DELIVERY

THE STANTON IRONWORKS COMPANY LIMITED NEAR NOTTINGHAM

Raw Material Markets

Iron and Steel

To replace one of its older blast furnaces already dismantled, the Cargo Fleet Iron Company, Limited, is to proceed immediately with the construction of a new furnace with a designed capacity of 4,500-5,000 tons a week. This is a project which cannot be brought to completion this year and, in the meantime, pig-iron production is barely sufficient for current needs. Were it not for the fact that liberal supplies of scrap are available, the manufacture of more basic iron would be an urgent necessity, for the output of both low- and high-phosphorus foundry iron is below requirements. All the blast furnaces engaged on hematite are promptly clearing their outputs and current deliveries are too limited to permit of any replenishment of stocks. Odd parcels of refined iron have recently been licensed for shipment, but with these exceptions the export of pig-iron is suspended.

Export quotas for re-rolled bars and sections have recently been augmented, but in this branch of the industry home demand is quiet and further business is urgently needed to ensure continuity of operations. Consumers are well supplied with billets, blooms, etc., and are not pressing for further deliveries at present, except in the case of small squares and flats. Sheet mills are working to the limit of their capacity and maintain a regular demand for sheet bars and slabs.

Rollers of all sizes of steel plates are overwhelmed with orders, and are unlikely to be able to provide all the allocated tonnages for the current period. Shipbuilders and boilermakers are pressing for maximum deliveries, and the recent announcement of several new shipbuilding contracts secured by East Coast and Scottish shipbuilders encourages the belief that full employment for the plate mills is assured for a long time ahead.

Non-ferrous Metals

Since the prices of non-ferrous metals are to-day almost entirely controlled from the United States, which is in effect a producers' market, the uncertainties of the General Election have not affected to any great extent, perhaps hardly at all, the course of values in the UK. Changes have been seen in scrap, but these relate to the balance of supply and demand much more than to events across the Atlantic. Generally speaking, activity in the non-ferrous industry has not suffered as a result of the political upheaval, and it would not appear that there has been any marked falling-off in the demand for semis.

A statement issued by the Colonial Office on Sunday records the outcome of negotiations which have been taking place in Washington in respect to the proposed transfer of British Government tin stocks to the US stockpile; America is to buy its Empire tin requirements through the existing market mechanism. Although this reveals the inability of the negotiators to reach a formal long-term contract for a given quantity of the metal, the statement points out that the tonnage objective has not been reduced. It was found, however, that there were "substantial difficulties—mainly of a technical nature—in the way of a formal long-term contract" and, accordingly, no such agreement will be concluded for the time being.

The week's tin prices are given on page 25.

There is no further news of the Government's proposal to unload a large tonnage of scrap on to the market, and the feeling is growing that this plan will be abandoned in favour of a speeding-up of the rate of monthly tonnage sold by tender. On almost every count it would be better to handle the surplus in this manner, and it is understood that talks are in progress between the Ministry of Supply and trade interests.

In the meanwhile, secondary metal prices are firm and, so far at any rate, there is little indication that dealers are nervous of the possible effect of additional scrap being put on to the market. In these days, when virgin-metal prices are so high, scrap is popular with users, for it shows a useful saving, even though the margins are not so good as they were some months ago. Brass swarf is showing a particularly firm front and it has been stated that £80 has been paid for this material.

House Organ

Foseco Foundry Practice No. 99. Published by Foundry Services, Limited, Long Acre, Nechells, Birmingham, 7.

An article in this issue outlines two methods of making a sheave pulley, using first a three-part box and then one of two parts. This is supplemented by the normal features.

Albion Works Bulletin, Vol. 4, No. 1. Published by John Harper & Company, Limited, Albion Works, Willenhall.

This issue carries an interesting note that recently a consignment of 250 oil heaters was shipped by air to Turkey. There is also a picture of the 100,000th No. 3177 gas griller hotplate being tested. Another picture is of three generations of the Lewis-Picken family still in the service of the company. The company entertained no fewer than 450 children of the employees to a party. This and many other social activities are recorded.

Nickel Bulletin—Vol. 23, No. 1. Published by the Mond Nickel Company, Limited, Sutherland House, Curzon Street, London, W.1.

This issue contains an article by W. H. Richardson, B.Sc., A.I.M., chief metallurgist, Langley Alloys, Limited, on "Casting in Nickel-Molybdenum and Nickel-Molybdenum-Chromium Alloys." Alloys of this type, which have high resistance to the attack of hydrochloric and other non-oxidising acids, have been available for some time in the United States under the name of "Hastelloy" and, more recently, similar materials "Chlorimet" and "Chemalloy" have appeared on the market. Another article describes the properties of the series of alloys marketed under the trade name of "Langalloy."

Analytical Methods

The *Centre Technique* has sent us a specimen—actually, the estimation of graphitic carbon—of a series of leaflets detailing methods of analysis, which is being distributed to members. The methods detailed have been tested and approved by the laboratories and are in process of standardisation. When the series is completed—and it will be very comprehensive—it will have covered the whole of the requirements of the foundry industry, both ferrous and non-ferrous. The specimen we have received fairly well follows British practice, and it is written in clear unambiguous language. Leaflets are perhaps preferable to books, as obsolescence is easy to rectify without vitiating a whole volume.